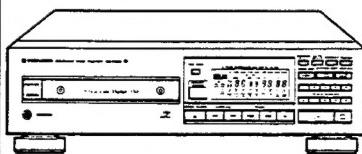




Service Manual



ORDER NO.
ARP1716

COMPACT DISC PLAYER

PD-X550

MODEL PD-X550 HAS TWO VERSIONS:

Type	Power requirement	Export destination
HEM	AC220V, 240V (Switchable) *	European continent
HB	AC220V, 240V (Switchable) *	United Kingdom

* Change the connection wire from Power switch board assembly to Transformer board assembly.

- This manual is applicable to the HEM and HB types.
- For the HB type, refer to page 71.
- Ce manuel pour le service comprend les explications en français de réglage.
- Este manual de servicio trata del método ajuste escrito en español.

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1. SAFETY INFORMATION

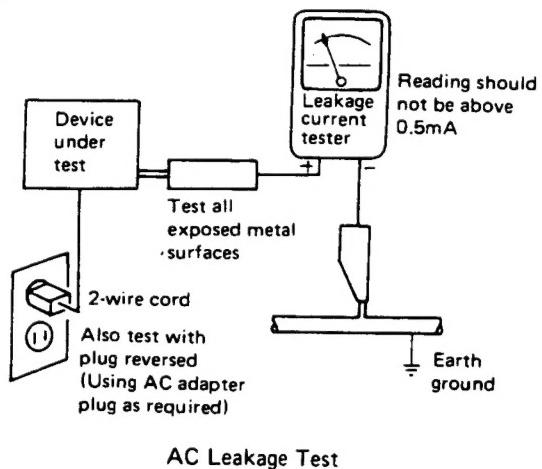
(FOR USA MODEL ONLY)

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.



ANY MEASUREMENTS NOT WITHIN THE LIMITS OUT-LINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

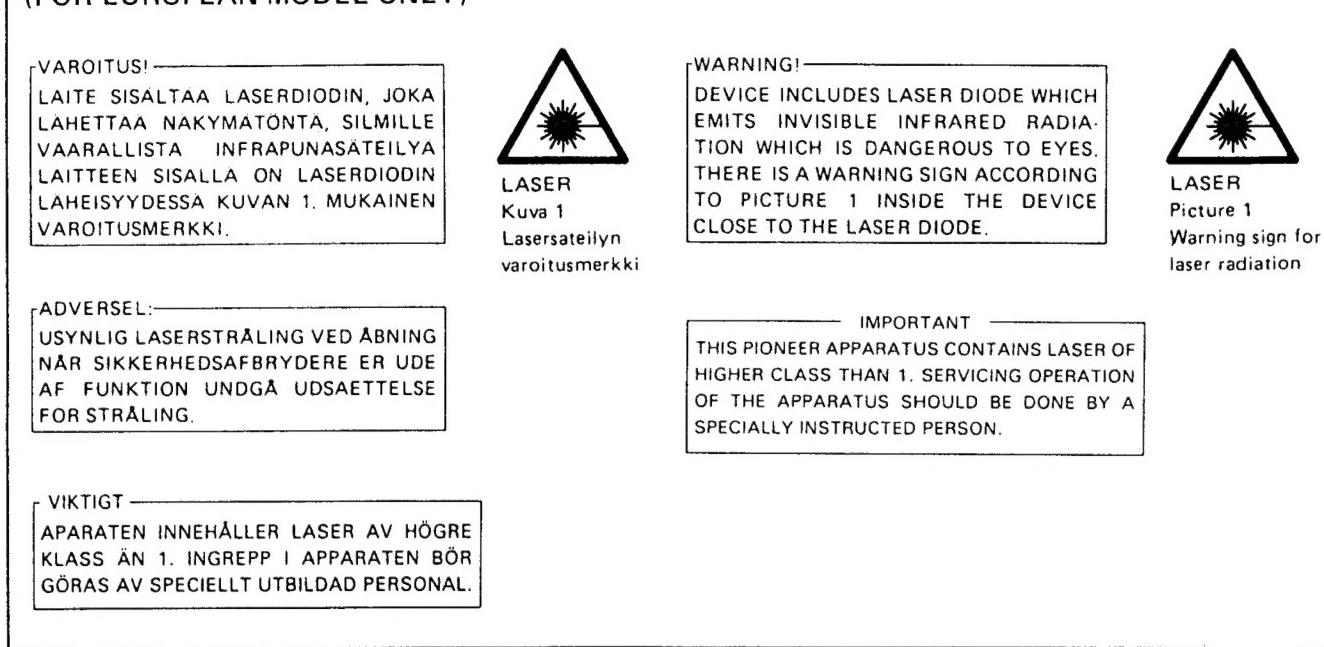
Electrical components having such features are identified by marking with a Δ on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

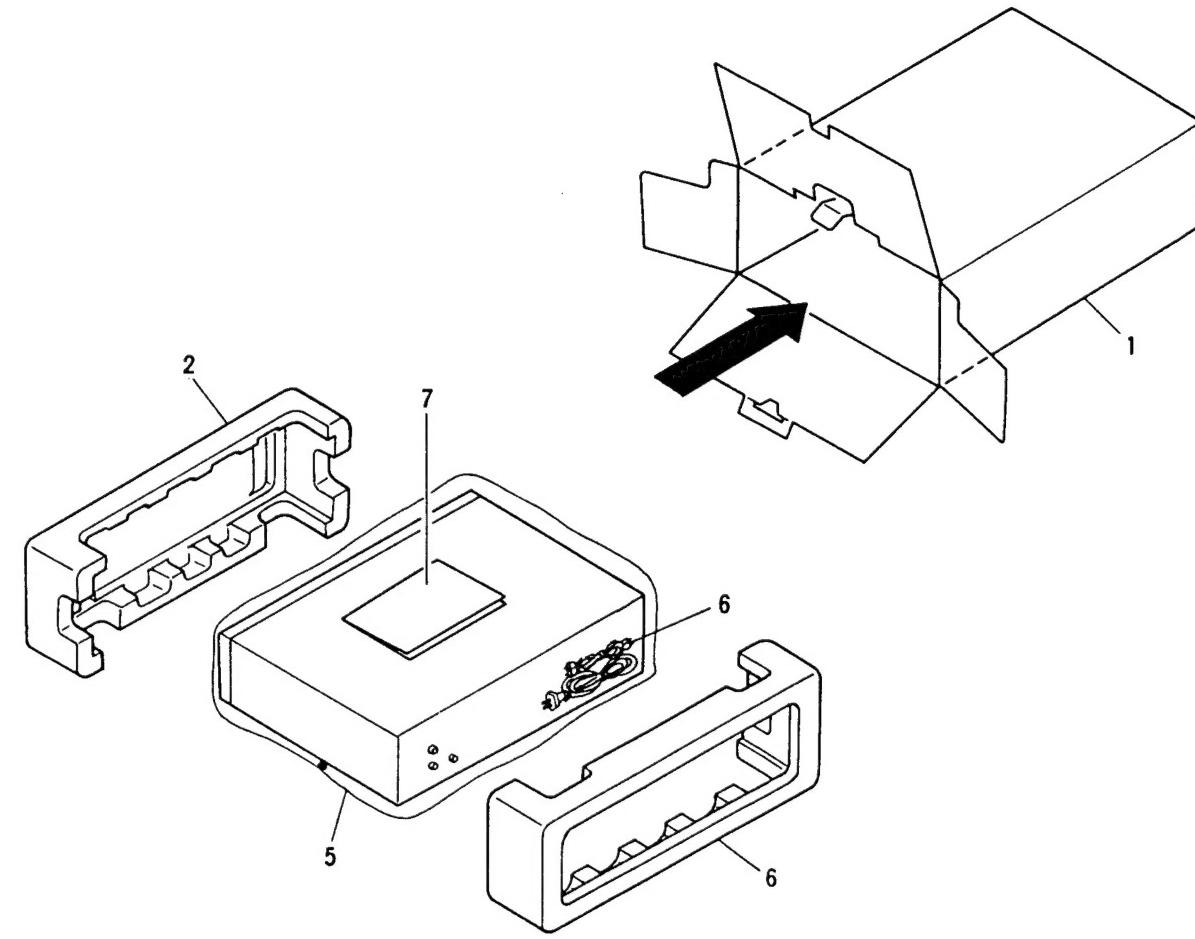
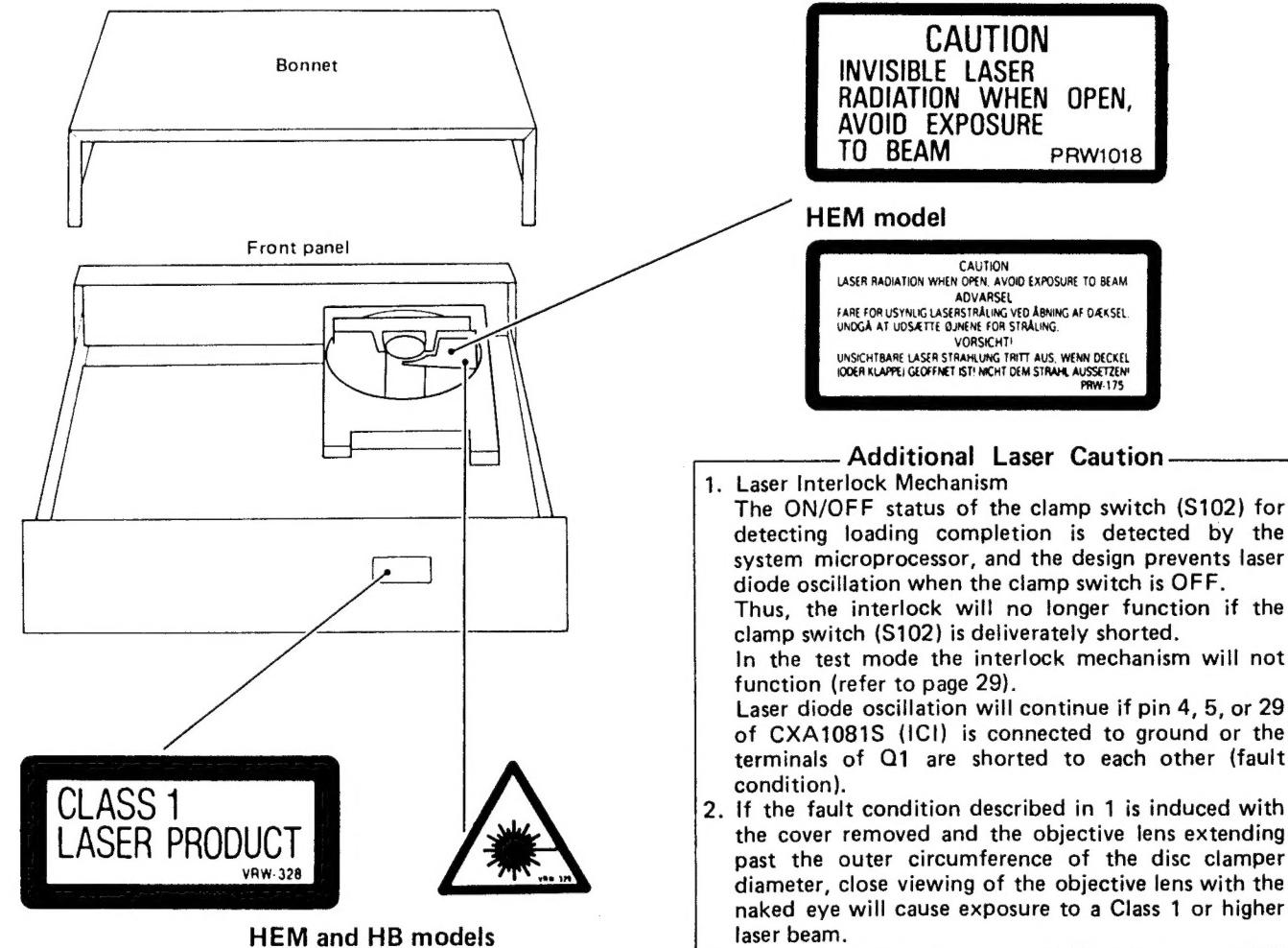
Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

2. PACKING

(FOR EUROPEAN MODEL ONLY)



LABEL CHECK



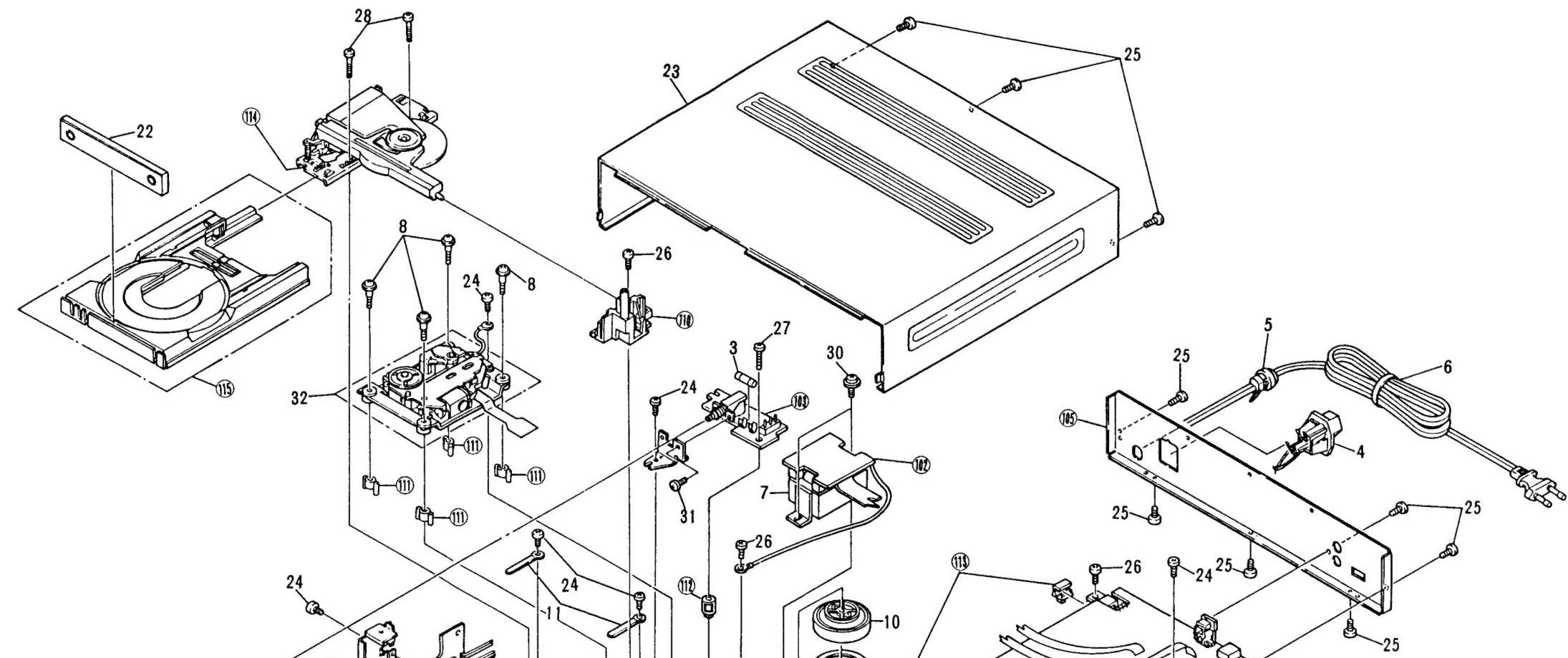
Parts List of Packing

Mark	No.	Part No.	Description
1	PHG1321	CD packing case	
2	PHA1070	Protector (F)	
3	PHA1071	Protector (R)	
4	PHC1030	Spacer (with in the tray)	
5	Z23-022	Mirror mat sheet	
6	PDE1023	Connection cord with pin plug	
7	PRE1094	Instruction manual	

3. EXPLODED VIEWS AND PARTS LIST

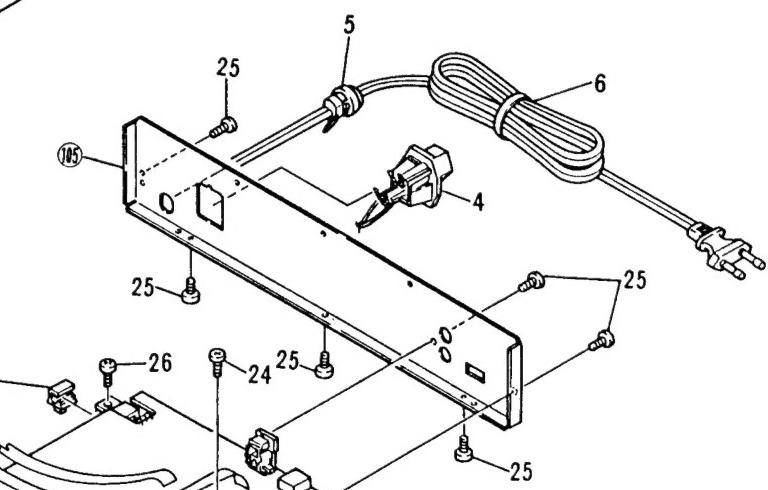
3.1 EXTERIOR

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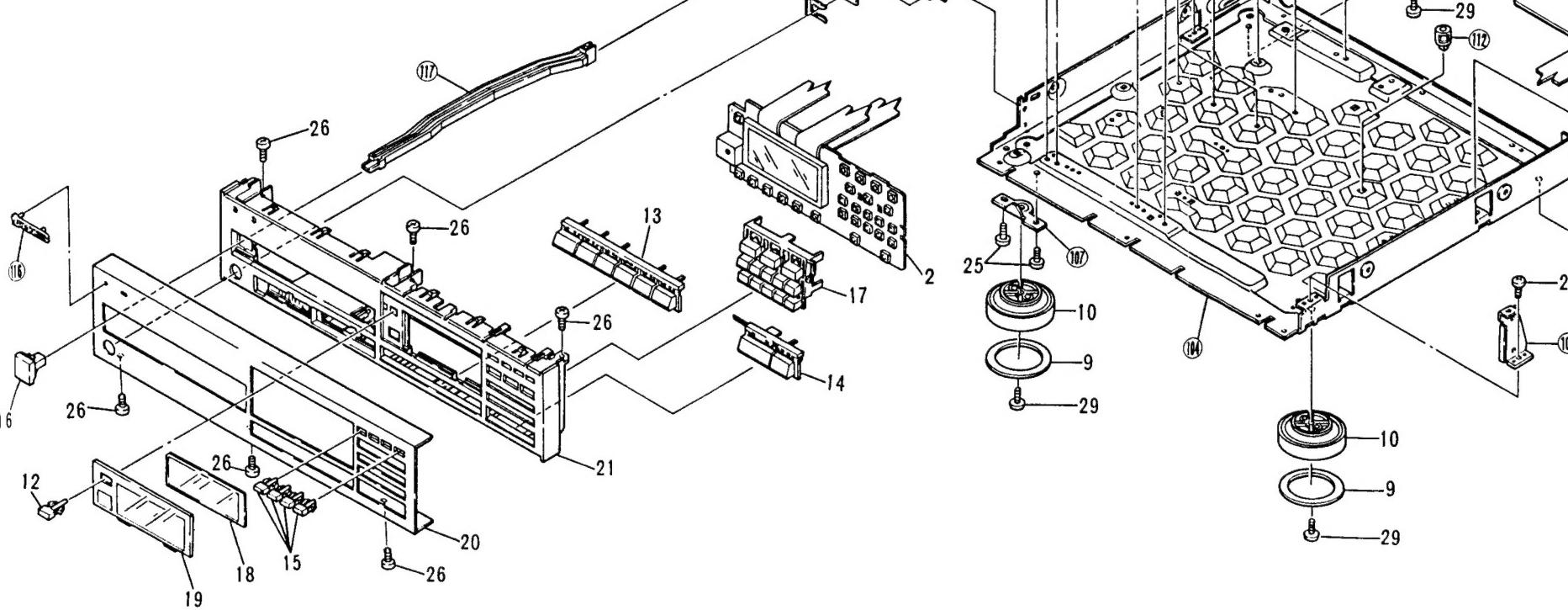
A

B



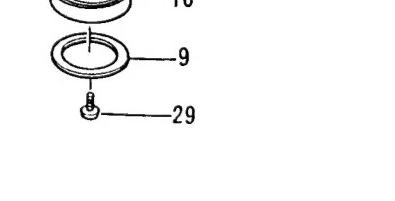
B

C



C

D



D

NOTES:

- Parts without part number cannot be supplied.
- The **△** mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by “◎” are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

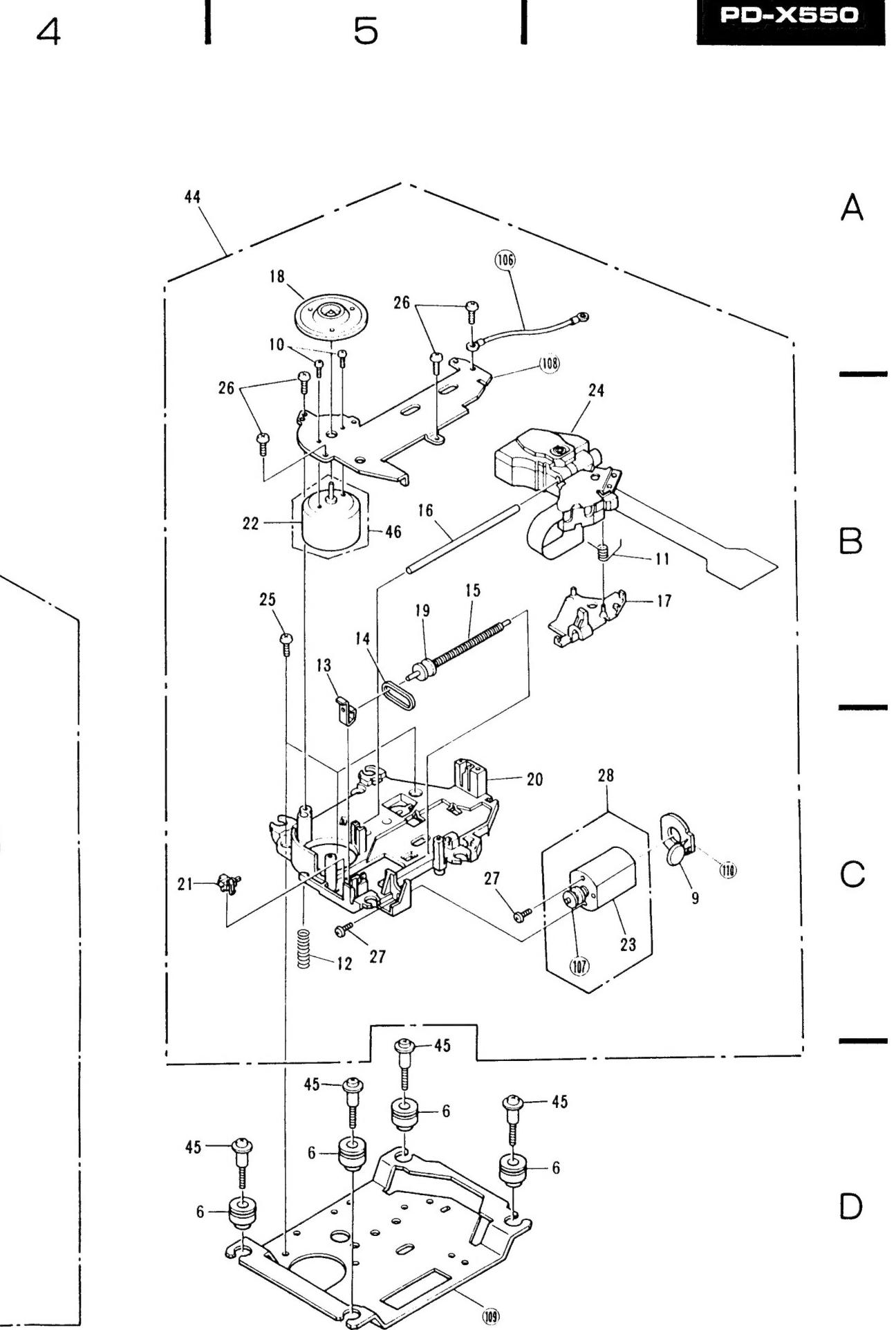
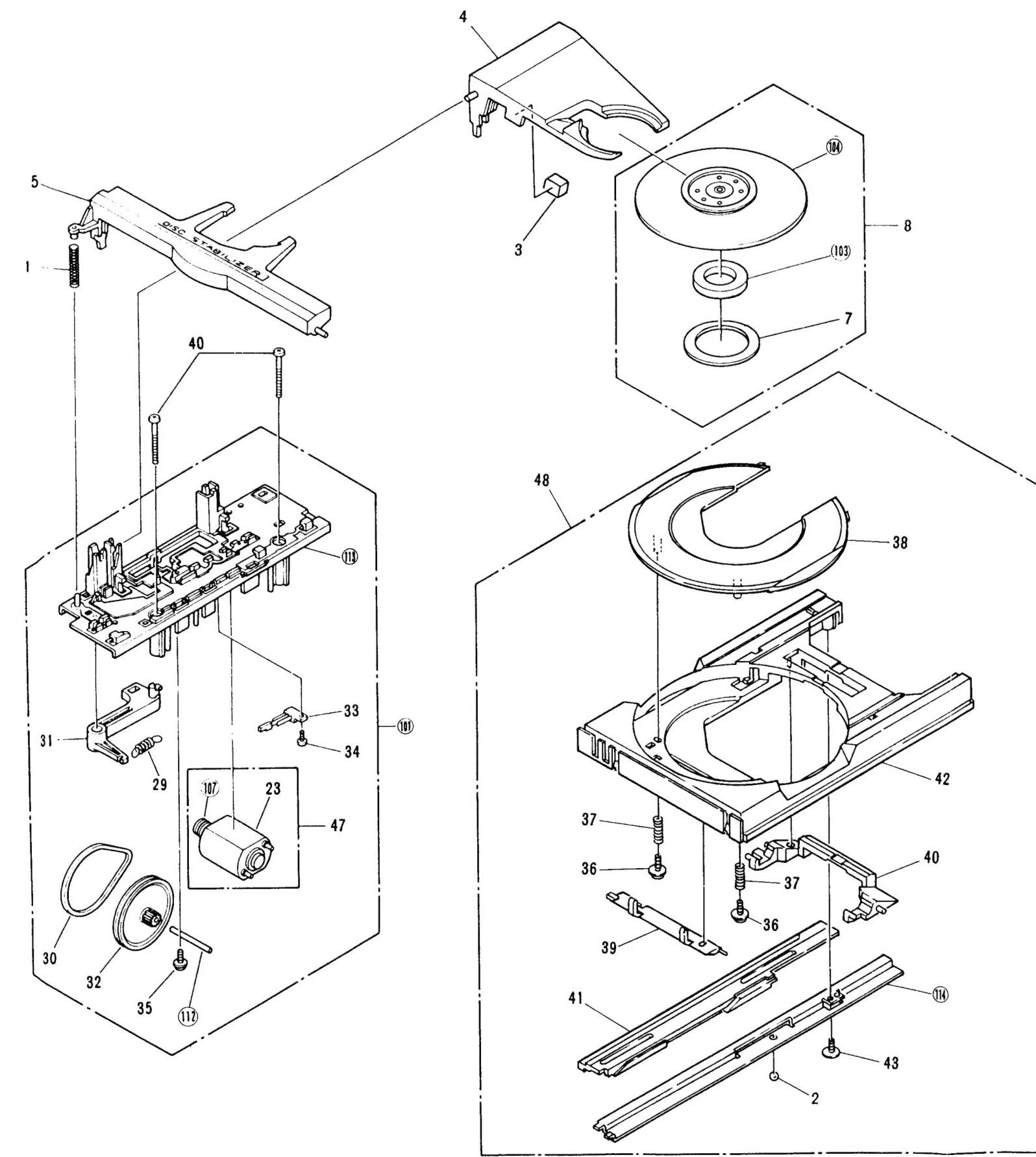
Parts List of Exterior

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
△ ◎	1	PWZ1634	Main board assembly		101		Headphone board assembly
◎	2	PWZ1637	Function board assembly		102		Transformer board assembly
△	3	REK-103	Fuse (2A)		103		Power switch board assembly
△	4	AKP-508	1P AC outlet		104		Under base
△	5	CM-22B	Strain relief		105		Rear base
△	6	PDG1008	AC power cord		106		Angle
△	7	PTT1063	Power transformer (AC220/240V)		107		Foot stand
	8	PBA1001	Screw		108		Angle L
	9	PNM1070	Stopper		109		Switch angle
	10	PNW1263	Insulator		110		Slide guide
	11	RNH-184	Cord clammer		111		Mechanism support
	12	PAC1088	Time button		112		PCB spacer
	13	PAC1147	Fuction button		113		P. plate holder
	14	PAC1148	P/S button		114		Loading base assembly
	15	PAC1169	fade button		115		Tray assembly
	16	PAC1170	Power button		116		Name plate
	17	PAC1273	Mode button		117		Power SW joint
	18	PAM1113	FL filter				
	19	PAM1289	Acrylic window				
	20	PAN1128	Front panel				
	21	PNW1180	Function panel				
	22	PNW1523	Plate				
	23	PYY1054	Bonnet				
	24	BBZ30P060FMC	Screw				
	25	BBZ30P080FCC	Screw				
	26	BBZ30P080FZK	Screw				
	27	BBZ30P160FMC	Screw				
	28	BBZ30P230FMC	Screw				
	29	IBZ30P120FCC	Screw				
	30	IBZ40P080FCC	Screw				
	31	PMZ30P060FCU	Screw				
	32	PYY1113	Servo mechanism assembly				

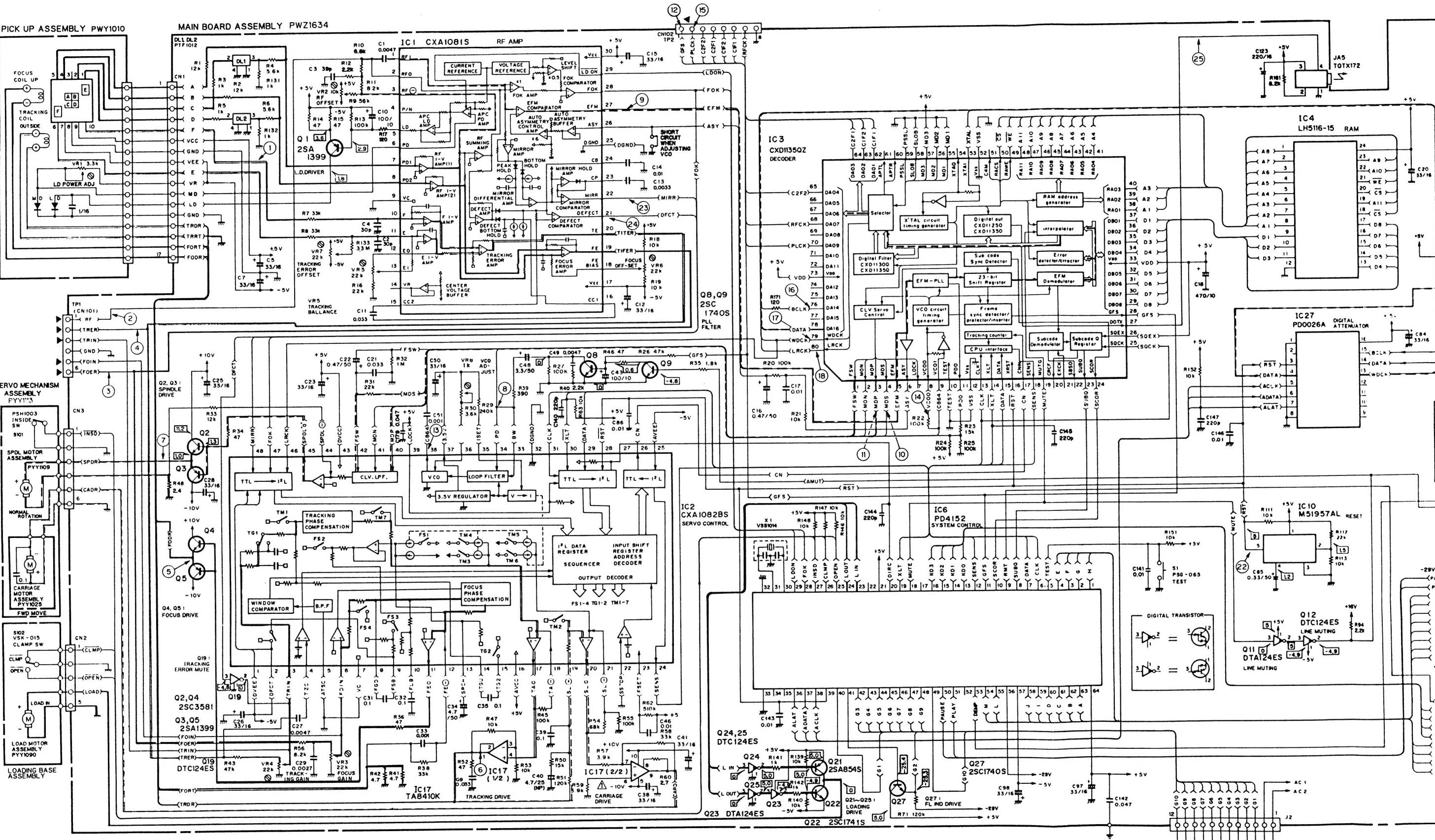
Parts List of Mechanism Section

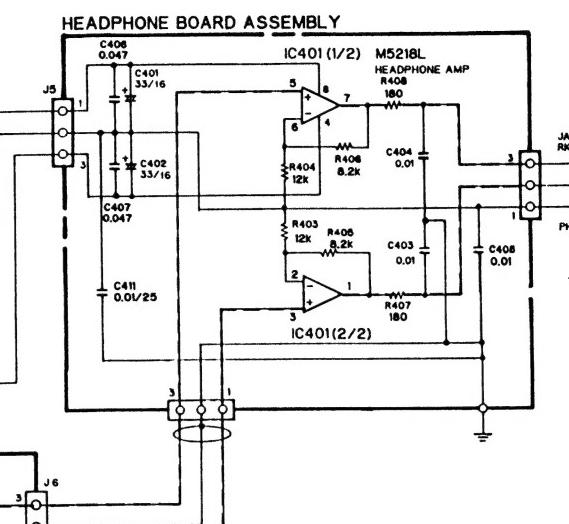
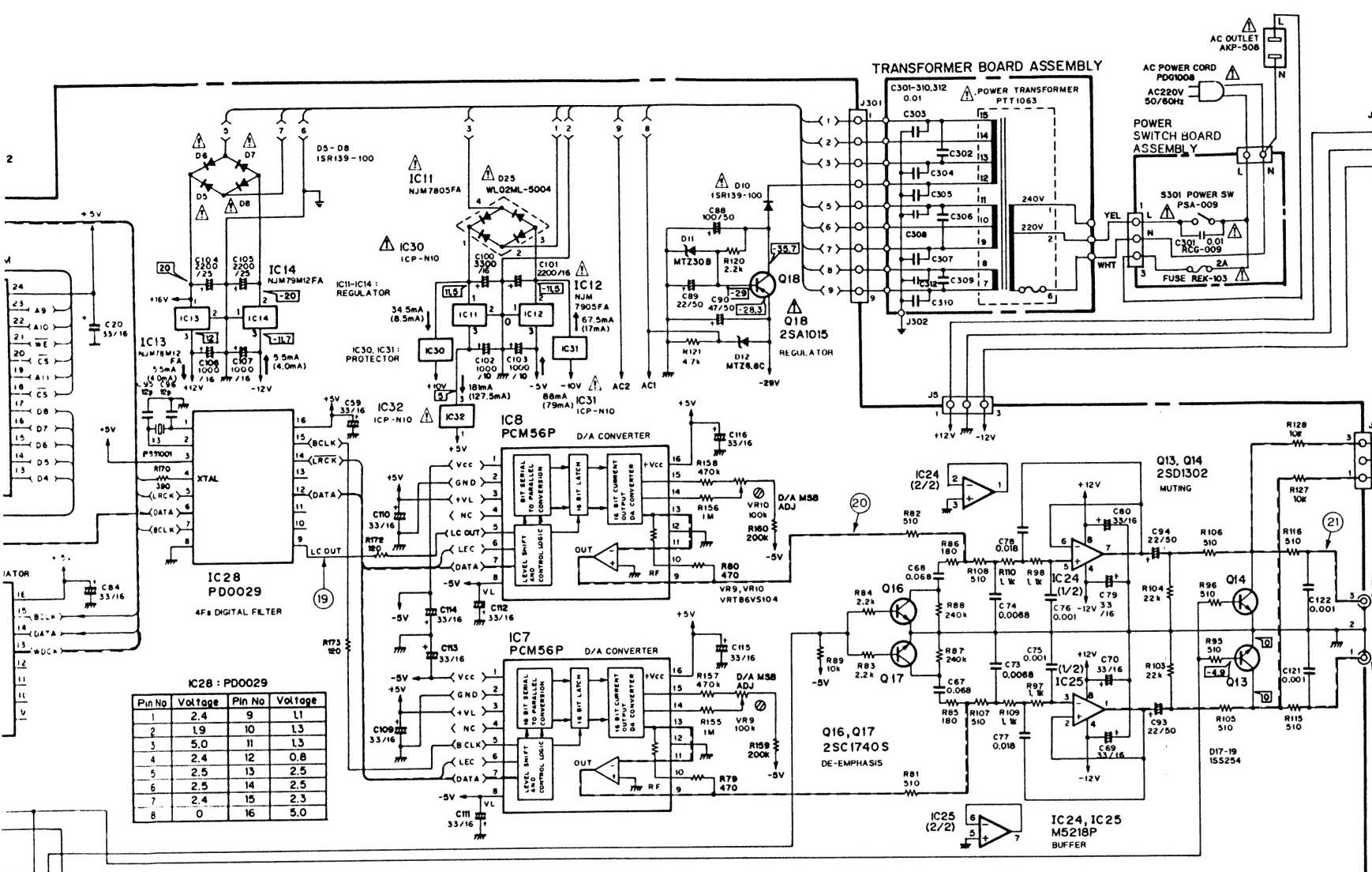
Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1	PBH1013	Spring		34	BPZ20P080FZK	Screw
	2	PBP-001	Steel ball φ4		35	IPZ30P060FMC	Screw
	3	PEB1032	Stopper rubber		36	PBA1025	Screw
	4	PNW1084	Clamp holder		37	PBH1045	Plate spring
	5	PNW1085	Clamp retainer		38	PNW1329	Disc plate
	6	PEB1031	Floating rubber		39	PNW1330	Plate lever (F)
	7	PNM1010	Disc cushion		40	PNW1331	Plate lever (R)
	8	PYY1084	Clamper assembly		41	PNW1332	Rack
	9	CGDYX104M25	Semiconductive ceramic capacitor		42	PNW1390	Tray
	10	PBA1037	Screw M2 x 2.5		43	PPZ30P080FMC	Screw
	11	PBH1008	Drive spring		44	PYY1113	Servo mechanism assembly
	12	PBH1009	Earth spring		45	PBA1001	Screw
	13	PBK1057	Plate spring		46	PYY1109	Motor assembly (with oil)
	14	PEB1072	Belt (CARRIAGE)		47	PYY1090	Motor assembly (LOADING)
	15	PLA1003	Drive worm		48	PYY1065	Tray assembly
	16	PLA1004	Guide bar		101		Loading base assembly
	17	PNW1063	Carriage plate		102	
	18	PNW1064	Disc table		103		Magnet
	19	PNW1066	Pulley		104		Clamper
	20	PNW1520	Mechanism chassis		105		Connector assembly (6P)
	21	PSH1003	Slide switch		106		Earth lead unit
	22	PXM1001	Spindle motor		107		Motor pulley
	23	PXM1002	Motor (CARRIAGE, LOADING)		108		Base plate
	24	PWY1010	Pick up assembly		109		Ballast base
	25	BBZ30P080FCC	Screw		110		Carriage M board
	26	BBZ30P080FZK	Screw				
	27	PBZ20P080FZK	Screw				
	28	PMZ20P030FMC	Screw				
	29	PYY1025	Motor assembly (CARRIAGE)				
	29	PBH1012	Clamp spring		111		Connector assembly (5P)
	30	PEB1013	Belt (LOADING)		112		Gear shaft
	31	PNW1083	Clamp lever		113		Loading base
	32	PNW1171	Gear pulley		114		Slide base
	33	VSK-015	Leaf switch				

3.2 MECHANISM SECTION



4. SCHEMATIC DIAGRAM





Line Voltage Selection for HEM and HB types
Line voltage can be changed with following steps.
1. Disconnect the AC power cord.
2. Remove the top cover.
3. Change the connection of the TRANSFORMER BOARD ASSEMBLY primary pins.
4. Stick the line voltage label on the rear panel.

Pins No.	Description
AAX-193	220V label
AAX-192	240V label

NOTE:

- RESISTORS:** Indicated in Ω, 1/8W & 1/4W, ±5% tolerance unless otherwise noted; k, kΩ, M, MΩ, (F); ±1%, (G); ±2%, (K); ±10%, (M); ±20% tolerance.
- CAPACITORS:** Indicated in capacity (μF)/voltage (V) unless otherwise noted; pF. Indication without voltage is 50V except electrolytic capacitor.
- VOLTAGE, CURRENT:**
 - DC voltage (V) at play state.
 - mA; DC current at play state.
 - Value in () is DC current at stop state.
- OTHERS:**
 - Signal route.
 - Adjusting point.

The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation. * marked capacitors and resistors have part numbers.

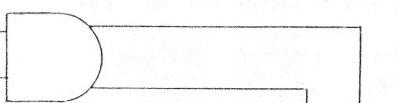
This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

6. SWITCHES : (The underlined indicates the switch position)

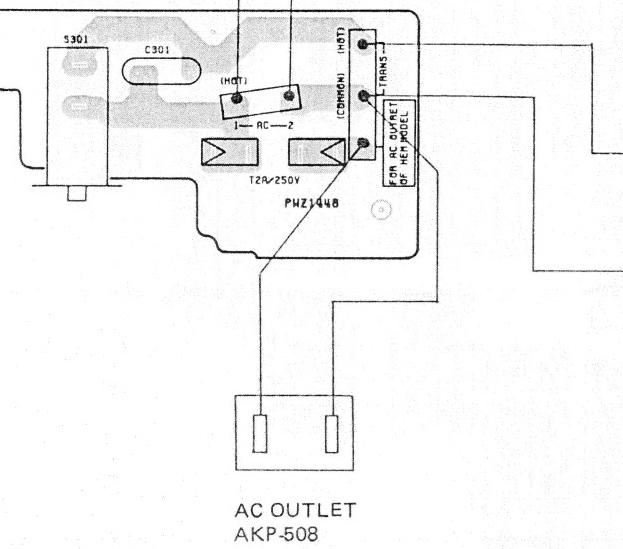
- MAIN BOARD ASSEMBLY**
 S1 : TEST
CONTROL BOARD ASSEMBLY
 S201 : OPEN/CLOSE
 S202 : PLAY
 S203 : PGM MEMORY
 S205 : M-3 (TRACK SEARCH)
 S206 : PAUSE
 S207 : INDEX
 S208 : TIME
 S209 : EDIT
 S210 : STOP
 S211 : TIME
 S212 : REP
 S213 : INDEX
 S214 : STEP
 S215 : TIME
 S216 : FADE
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 S313 : FADE
 S314 : INDEX
 S315 : TIME
 S316 : FADE
 S317 : INDEX
 S318 : TIME
 S319 : FADE
 S320 : INDEX
 S321 : TIME
 S322 : FADE
 S323 : INDEX
 S324 : TIME
 S325 : FADE
 S326 : INDEX
 S327 : TIME
 S328 : FADE
 S329 : INDEX
 S330 : TIME
 S331 : FADE
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 S333 : TIME
 S334 : FADE
 S335 : INDEX
 S336 : TIME
 S337 : FADE
 S338 : INDEX
 S339 : TIME
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 S341 : INDEX
 S342 : TIME
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 S348 : TIME
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 S353 : INDEX
 S354 : TIME
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 S372 : TIME
 S373 : FADE
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 S376 : FADE
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 S379 : FADE
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 S344 : INDEX
 S345 : TIME
 S346 : FADE
 S347 : INDEX
 S348 : TIME
 S349 : FADE
 S350 : INDEX
 S351 : TIME
 S352 : FADE
 S353 : INDEX
 S354 : TIME<br

5. P.C. BOARDS CONNECTION DIAGRAM

AC POWER CORD
AC220V
50/60 Hz
PDG1008

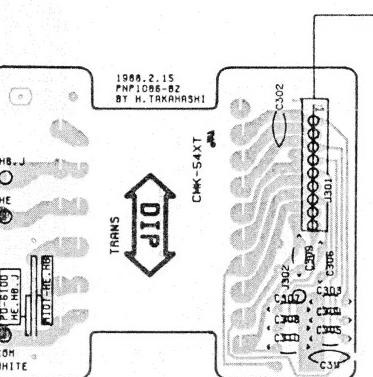


A
SWITCH BOARD ASSEMBLY

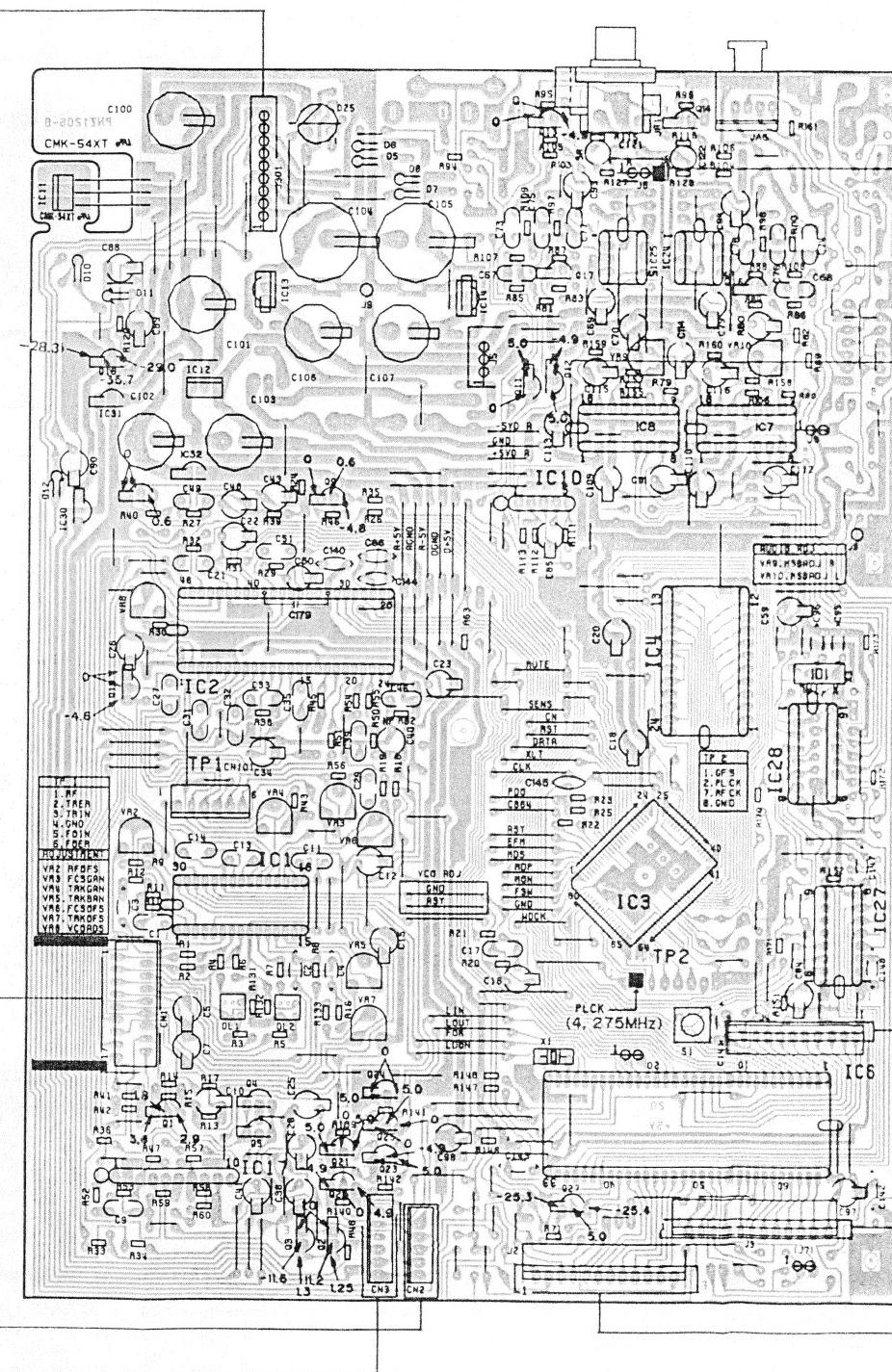


AC OUTLET
AKP-508

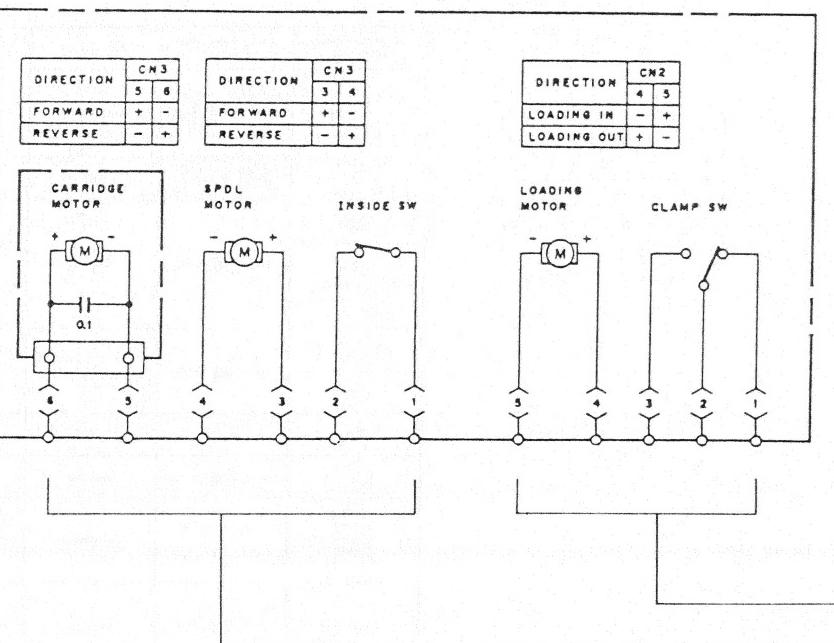
B
TRANSFORMER BOARD ASSEMBLY



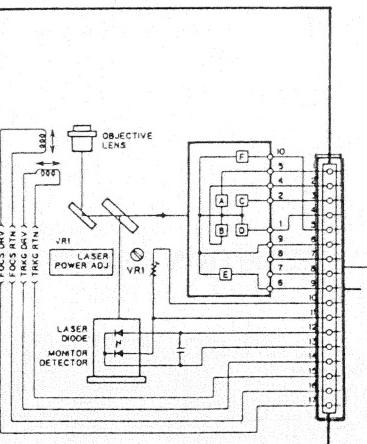
C
MAIN BOARD ASSEMBLY (PWZ1444)



D
SERVO MECHANISM ASSEMBLY



E
PICK UP ASSEMBLY



7

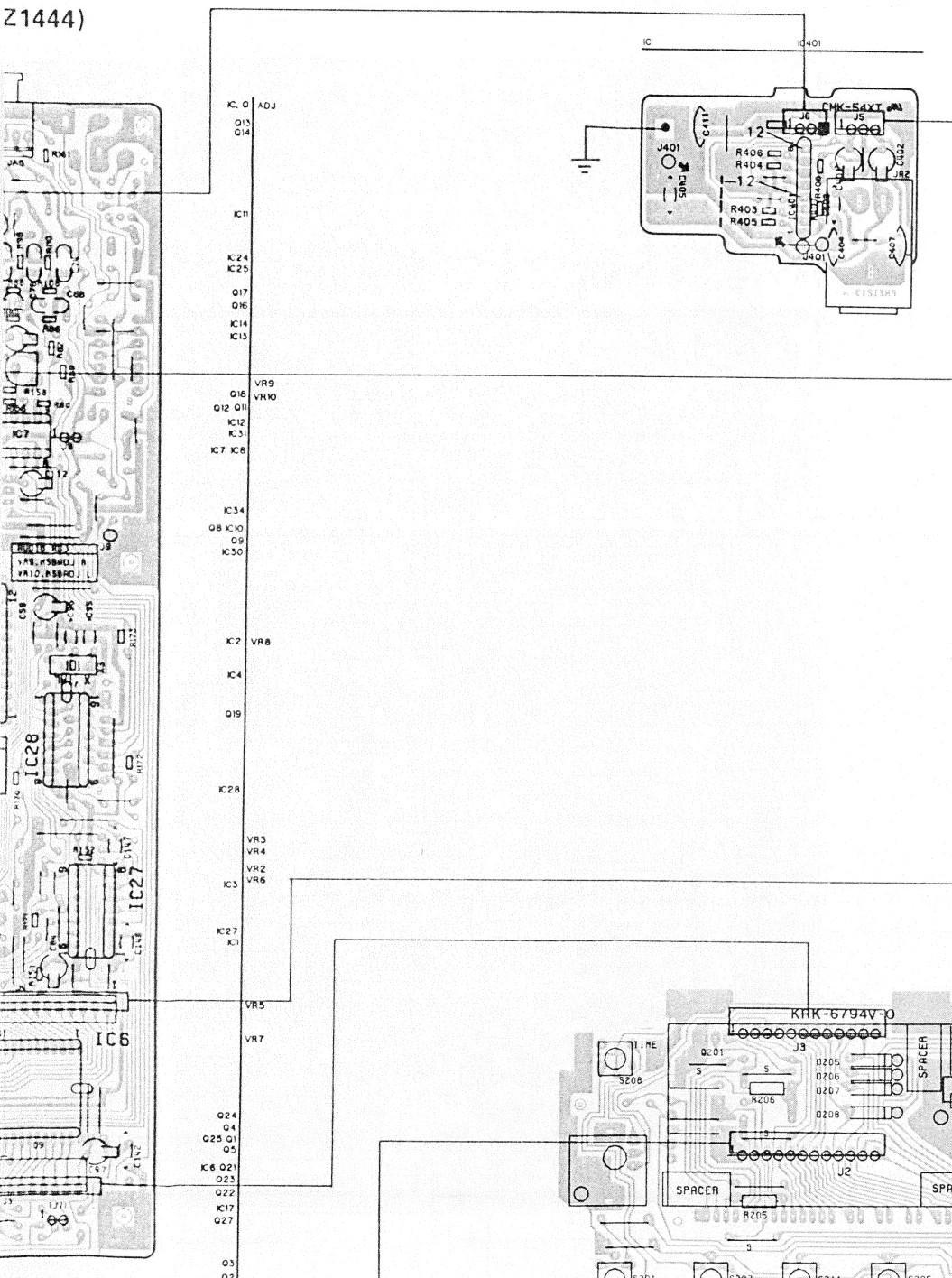
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9

10

1

HEADPHONE BOARD ASSEMBLY



FUNCTION BOARD ASSEMBLY

DC voltage of Semiconductors (at PLAY)																									
IC1 CXA10815					IC2 CXA10820S					IC3 CXD11350Z					IC7 PCM56P					IC4 LHM2116-1					
Pin No	Voltage	Pin No	Voltage	Pin No	Voltage	Pin No	Voltage	Pin No	Voltage	Pin No	Voltage	Pin No	Voltage	Pin No	Voltage	Pin No	Voltage	Pin No	Voltage	Pin No	Voltage	Pin No	Voltage	Pin No	Voltage
1	-1.5	16	-3	5	-25	5	-5	2	-32	19	-62	0	1	-4.9	1	-2.5	2	0	3	2.5	4	2.5	5	2.5	
2	-1.5	17	-5	3	0	27	5	3	25	33	5	63	0	2	2.5	2	2.5	3	2.5	4	2.5	5	2.5		
3	0	18	-1	4	0	29	5	4	24	35	19	64	0	3	2.5	3	2.5	4	2.5	5	2.5	6	2.5		
4	-2.4	19	0	5	0	29	5	5	24	35	19	65	0	5	2.5	5	2.5	6	2.5	7	2.5	8	2.5		
5	-2.5	20	0	6	0	30	5	6	25	36	19	66	0	7	2.5	7	2.5	8	2.5	9	2.5	10	0		
6	-4.8	21	-4.9	7	0	31	5	8	0	32	0	67	0	9	2.4	38	2.5	68	2.5	10	0	11	0		
7	0	22	0	9	0	33	2.5	10	0	34	2.5	70	2.3	11	0	40	2.5	71	2.3	12	0	13	0		
8	0	23	-1	10	0	34	2.5	11	0	35	2.5	13	0	42	2.5	72	0	14	0	15	0	16	0		
9	0	24	-2.1	12	0	36	2.3	13	0.2	37	3.5	15	0	43	2.5	73	5	16	0	17	0	18	0		
10	0	25	0	14	0	38	2.4	15	0	39	5	17	0	44	2.5	74	0	18	0	19	1.9	20	0		
11	0	26	2.5	15	0	40	2.5	16	5	40	2.5	18	0	45	2.5	75	2.4	19	0	20	0	21	0		
12	-1.2	27	2.4	17	0	41	5	19	0	42	2.5	20	0	44	0	50	2.5	76	2.3	21	0	22	0	23	0
13	-0.1	28	5	18	0	43	5	20	0	44	0	21	0	45	0	52	0	23	0	24	0	25	0	26	0
14	0	29	0	19	0	45	5	22	0	46	2.5	23	-4.1	47	5	53	2.2	24	0	25	0	26	0	27	0
15	-3.1	30	5	20	0	46	0	24	5	48	0	21	0	49	4.4	79	2.5	22	0	23	0	24	0	25	0
IC10 M51957A					IC11 NJM7805FA					IC13 NJM78M12FA					IC24 M5218P					ICB PCM56P					
Pin No	Voltage	Pin No	Voltage	Pin No	Voltage	Pin No	Voltage	Pin No	Voltage	Pin No	Voltage	Pin No	Voltage	Pin No	Pin No	Pin No	Pin No	Pin No	Pin No	Pin No	Pin No	Pin No	Pin No	Pin No	Pin No
1	5.0	2	1.5	3	0	4	1.5	5	0	6	1.15	7	0	8	0	9	0	10	0	11	0	12	0	13	0
1	0	4	1.2	5	0	6	2.0	7	-2.1	8	0	9	0	10	-0.6	11	-0.6	12	-0.6	13	-0.6	14	-0.6	15	-0.6
2	0	5	5.0	21	0	22	0	23	-4.1	24	5	48	0	21	0	51	2.3	22	0	23	0	24	0	25	0
3	0	4	0	20	0	21	0	22	0	23	0	24	0	21	0	52	0	22	0	23	0	24	0	25	0
4	0	5	-14	5	0	6	0	7	1.15	8	0	9	0	10	0	53	2.2	11	0	12	0	13	0	14	0
5	0	6	0	17	0	18	0	19	0	20	0	21	0	17	0	54	2.2	18	0	19	0	20	0	21	0
6	0	7	0	21	0	22	0	23	0	24	0	25	0	17	5	55	0	18	0	19	0	20	0	21	0
7	0	8	0	21	0	22	0	23	0	24	0	25	0	17	5	56	0	18	0	19	0	20	0	21	0
8	0	9	-0.6	18	0	19	0	20	0	21	0	22	0	18	2.5	57	5.0	19	0	20	0	21	0	22	0
9	0	10	-0.6	19	0	20	0	21	0	22	0	23	0	19	5	58	0	20	0	21	0	22	0	23	0
10	0	11	-0.6	20	0	21	0	22	0	23	0	24	0	19	5	59	0	20	0	21	0	22	0	23	0
11	IL3	12	NJM7905FA	13	NJM79M12FA	14	NJM79M12FA	15	0	16	-11.5	17	-17	18	0	19	0	20	0	21	0	22	0	23	0
12	NJM7905FA	13	NJM79M12FA	14	NJM79M12FA	15	0	16	-2	17	-20	18	-37	19	-40	20	0	21	0	22	0	23	0	24	0
13	NJM7905FA	14	NJM79M12FA	15	NJM79M12FA	16	0	17	-2	18	-20	19	-37	20	-40	21	0	22	0	23	0	24	0	25	0
14	NJM7905FA	15	NJM79M12FA	16	NJM79M12FA	17	0	18	-2	19	-20	20	-37	21	-40	22	0	23	0	24	0	25	0	26	0
15	NJM7905FA	16	NJM79M12FA	17	NJM79M12FA	18	0	19	-2	20	-20	21	-37	22	-40	23	0	24	0	25	0	26	0	27	0
16	NJM7905FA	17	NJM79M12FA	18	NJM79M12FA	19	0	20	-2	21	-20	22	-37	23	-40	24	0	25	0	26	0	27	0	28	0
17	NJM7905FA	18	NJM79M12FA	19	NJM79M12FA	20	0	21	-2	22	-20	23	-37	24	-40	25	0	26	0	27	0	28	0	29	0
18	NJM7905FA	19	NJM79M12FA	20	NJM79M12FA	21	0	22	-2	23	-20	24	-37	25	-40	26	0	27	0	28	0	29	0	30	0
19	NJM7905FA	20	NJM79M12FA	21	NJM79M12FA	22	0	23	-2	24	-20	25	-37	26	-40	27	0	28	0	29	0	30	0	31	0
20	NJM7905FA	21	NJM79M12FA	22	NJM79M12FA	23	0	24	-2	25	-20	26	-37	27	-40	28	0	29	0	30	0	31	0	32	0
21	NJM7905FA	22	NJM79M12FA	23	NJM79M12FA	24	0	25	-2	26	-20	27	-37	28	-40	29	0	30	0	31	0	32	0	33	0
22	NJM7905FA	23	NJM79M12FA	24	NJM79M12FA	25	0	26	-2	27	-20	28	-37	29	-40	30	0	31	0	32	0	33	0	34	0
23	NJM7905FA	24	NJM79M12FA	25	NJM79M12FA	26	0	27	-2	28	-20	29	-37	30	-40	31	0	32	0	33	0	34	0	35	0
24	NJM7905FA	25	NJM79M12FA	26	NJM79M12FA	27	0	28	-2	29	-20	30	-37	31	-40	32	0	33	0	34	0	35	0	36	0
25	NJM7905FA	26	NJM79M12FA	27	NJM79M12FA	28	0	29	-2	30	-20	31	-37	32	-40	33	0	34	0	35	0	36	0	37	0
26	NJM7905FA	27	NJM79M12FA	28	NJM79M12FA	29	0	30	-2	31	-20	32	-37	33	-40	34	0	35	0	36	0	37	0	38	0
27	NJM7905FA	28	NJM79M12FA	29	NJM79M12FA	30	0	31	-2	32	-20	33	-37	34	-40	35	0	36	0	37	0	38	0	39	0
28	NJM7905FA	29	NJM79M12FA	30	NJM79M12FA	31	0	32	-2	33	-20	34	-37	35	-40	36	0	37	0	38	0	39	0	40	0
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30	NJM7905FA	31	NJM79M12FA	32	NJM79M12FA	33	0	34	-2	35	-20	36	-37	37	-40	38	0	39	0	40	0	41	0	42	0
31	NJM7905FA	32	NJM79M12FA	33	NJM79M12FA	34	0	35	-2	36	-20	37	-37	38	-40	39	0	40	0	41	0	42	0	43	0
32	NJM7905FA	33	NJM79M12FA	34	NJM79M12FA	35	0	36	-2	37	-20	38	-37	39	-40	40	0	41	0	42	0	43	0	44	0
33	NJM7905FA	34	NJM79M12FA	35	NJM79M12FA	36	0	37	-2	38	-20	39	-37	40	-40	41	0	42	0	43	0	44	0	45	0
34	NJM7905FA	35	NJM79M12FA	36	NJM79M12FA	37	0	38	-2	39	-20	40	-37	41	-40	42	0	43	0	44	0	45	0	46	0
35	NJM7905FA	36	NJM79M12FA	37	NJM79M12FA	38	0	39	-2	40	-20	41	-37	42	-40	43	0	44	0	45	0	46	0	47	0
36	NJM7905FA	37	NJM79M12FA	38	NJM79M12FA	39	0	40	-2	41	-20	42	-37	43	-40	44	0	45	0	46	0	47	0	48	0
37	NJM7905FA	38	NJM79M12FA	39	NJM79M12FA	40	0	41	-2	42	-20	43	-37	44	-40	45	0	46	0	47	0	48	0	49	0
38	NJM7905FA	39	NJM79M12FA	40	NJM79M12FA	41	0	42	-2	43	-20	44	-37	45	-40	46	0	47	0	48	0	49	0	50	0
39	NJM7905FA	40	NJM79M12FA	41	NJM79M12FA	42	0	43	-2	44	-20	45	-37	46	-40	47	0	48	0	49	0	50	0	51	0
40	NJM7905FA	41	NJM79M12FA	42	NJM79M12FA	43	0	44	-2	45	-20	46	-37	47	-40	48	0	49	0	50	0	51	0	52	0
41	NJM7905FA	42	NJM79M12FA	43	NJM79M12FA	44	0	45	-2	46	-20	47	-37	48	-40	49	0	50	0	51	0	52	0	53	0
42	NJM7905FA	43	NJM79M12FA	44	NJM79M12FA	45	0	46	-2	47	-20	48	-37	49	-40	50	0	51	0	52	0	53	0	54	0
43	NJM7905FA	44	NJM79M12FA	45	NJM79M12FA	46	0	47	-2	48	-20	49	-37	50	-40	51	0	52	0	53	0	54	0	55	0

PCB pattern diagram indication	Corresponding part symbol	Part name	PCB pattern diagram indication	Corresponding part symbol	Part name
[Image: two parallel lines forming a U-shape]	[Image: two parallel lines forming a U-shape with a circle at each end]	Transistor	[Image: two parallel lines forming a U-shape]		Ceramic capacitor
[Image: two parallel lines forming a U-shape with a small circle at the top center]	[Image: two parallel lines forming a U-shape with a circle at each end]	FET	[Image: two parallel lines forming a U-shape]		Mylar capacitor
OK			[Image: a circle with a diagonal line through it]		Styrol capacitor
≈	o— —o	Diode	[Image: a circle with a diagonal line through it]	o— —o	Electrolytic capacitor (Non-polarized)
△			[Image: a circle with a diagonal line through it]	o— —o	Electrolytic capacitor (Non-polarized)
QF			[Image: a circle with a diagonal line through it]	o— —o	Electrolytic capacitor (Polarized)
QF	o— —o	Zener dioda	[Image: a circle with a diagonal line through it]	o— —o	Electrolytic capacitor (Polarized)
≈	o— —o	LED	[Image: a rectangle with rounded ends]	o— —o	Power capacitor
[Image: a rectangle with rounded ends]	o— —o	Varactor	[Image: a rectangle with rounded ends]	o— —o	Semi fixed resistor
[Image: a rectangle with a small square at each corner]	o— —o		[Image: a rectangle with rounded ends]		Resistor array
[Image: a rectangle with a small square at each corner]	o— —o	Tact switch	[Image: a rectangle with rounded ends]		
~	o— —o	Inductor	~	o— —o	Resistor
[Image: a rectangle with rounded ends]			[Image: a rectangle with rounded ends]		
[Image: a circle with a diagonal line through it]	o— —o	Coil	[Image: a rectangle with rounded ends]	o— —o	Resonator
[Image: a rectangle with rounded ends containing a circle with a diagonal line through it]		Transformer	[Image: a rectangle with rounded ends]	o— —o	Thermistor
[Image: a rectangle with rounded ends containing a circle with a diagonal line through it]					
		Filter			

1. This P.C.B. connection diagram is viewed from the pads mounted side.

1. This P.C.B. connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in D.

2. The parts which have been mounted on the board can be replaced above Table.

3. The capacitor terminal marked with is

6. The transistor terminal marked with [] shows emitter side.

9. The transistor terminal marked with shows emitt

7

8

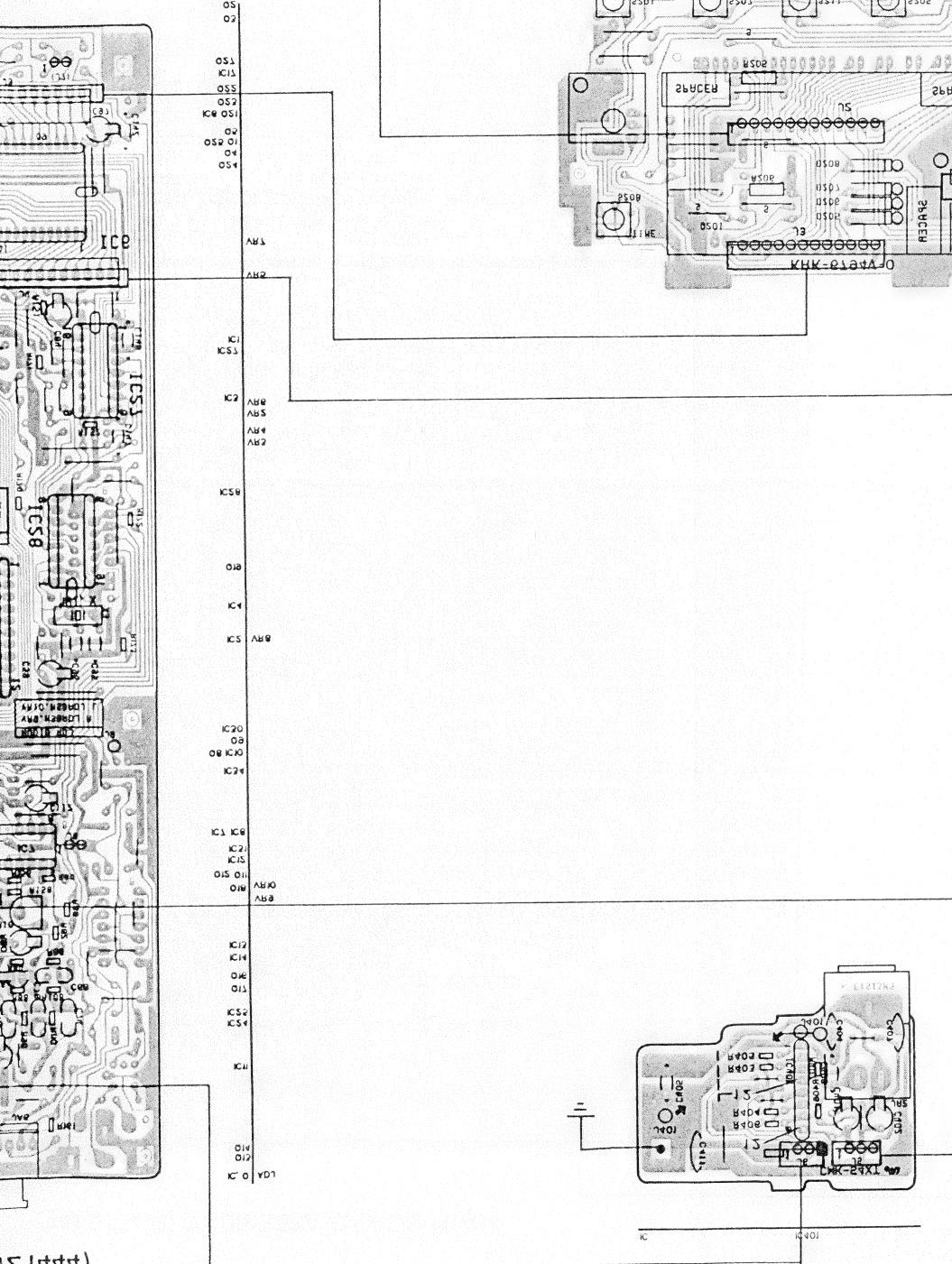
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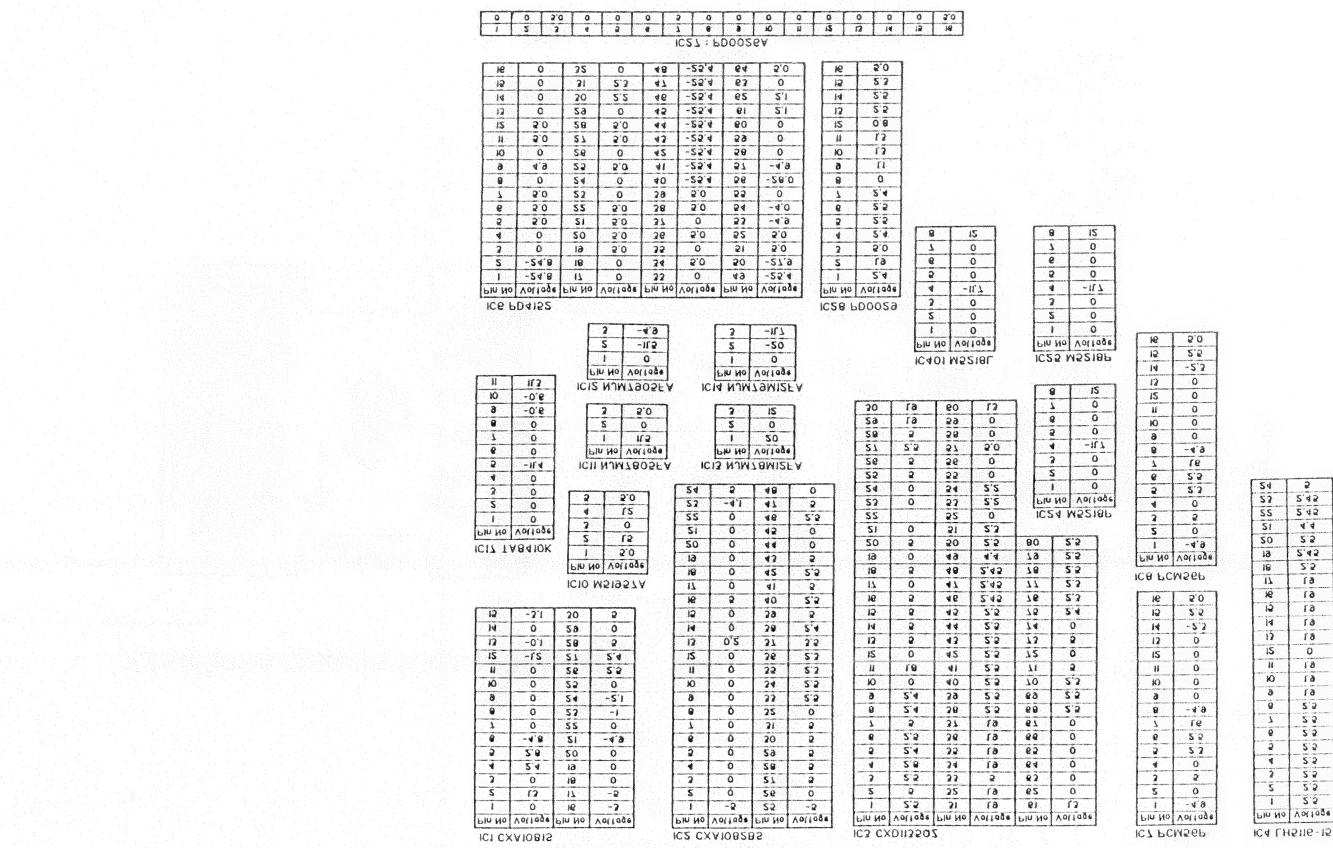
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12

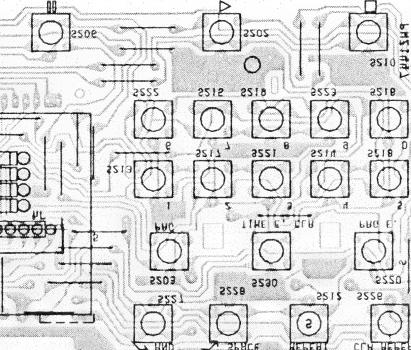
18



HEADPHONE BOARD MASSAGE

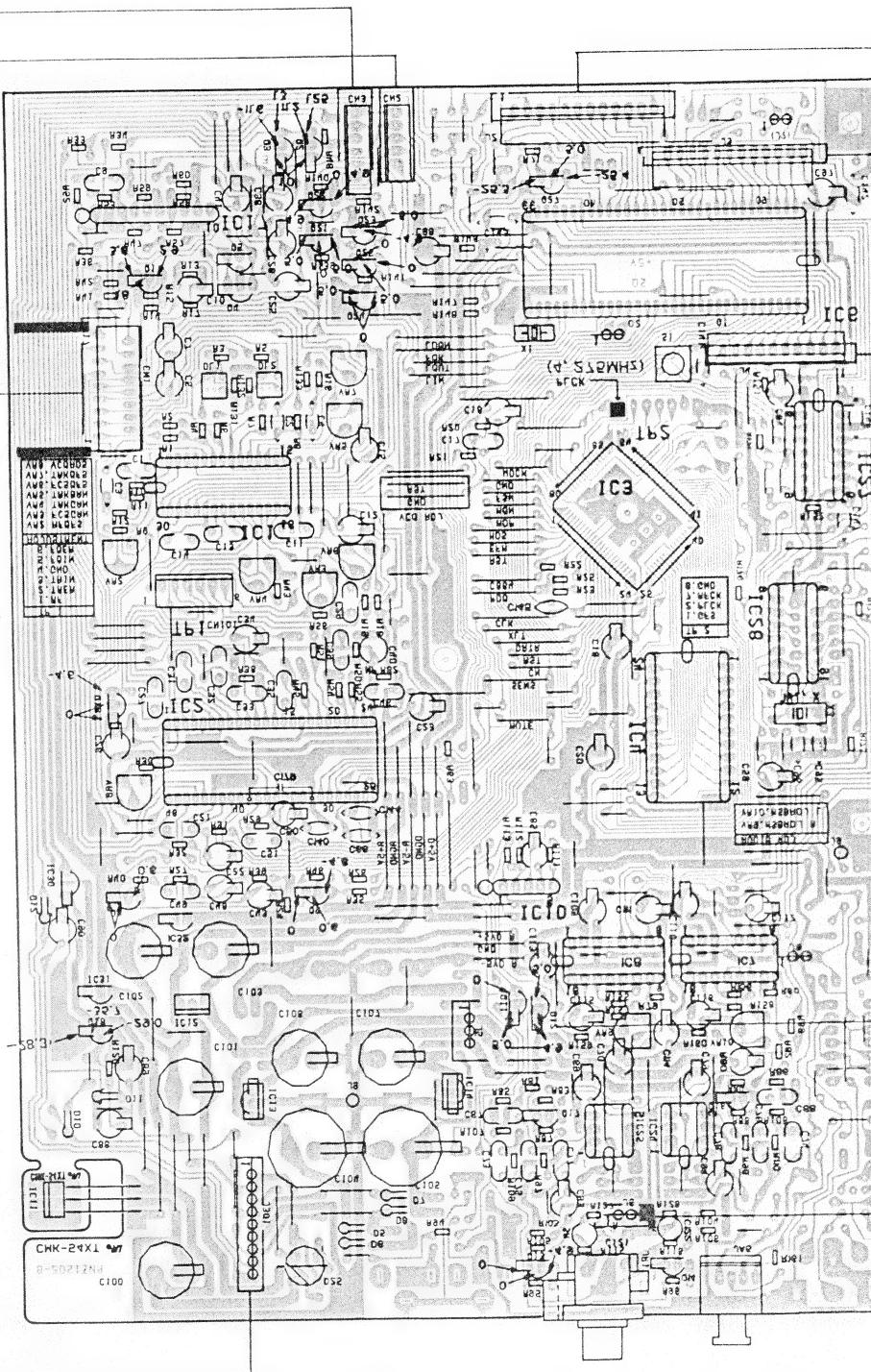
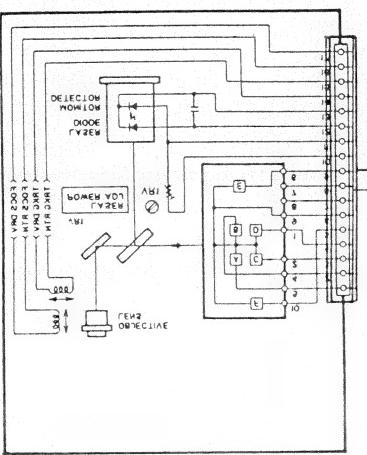
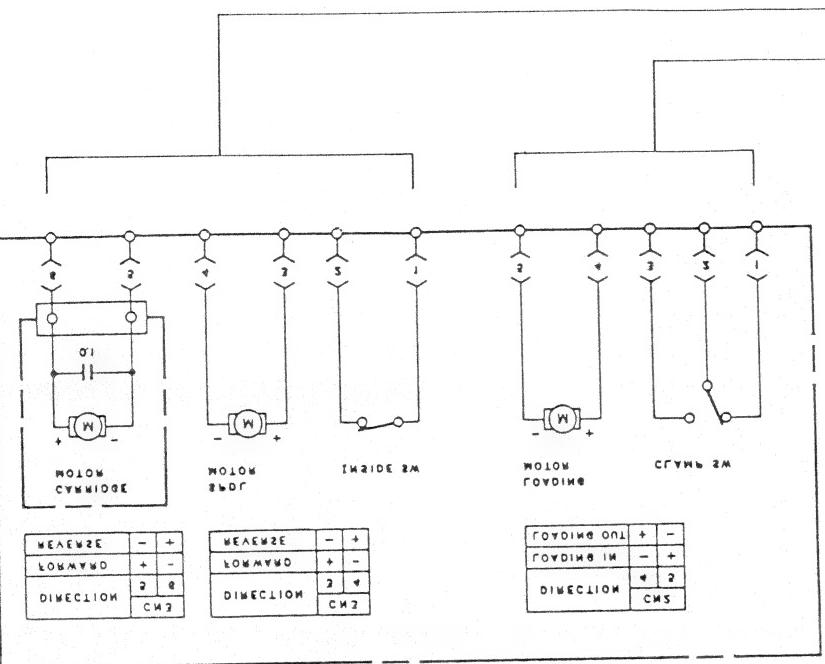
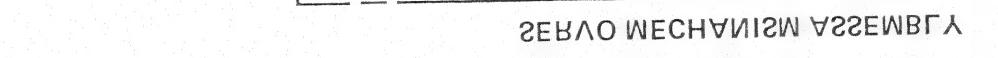
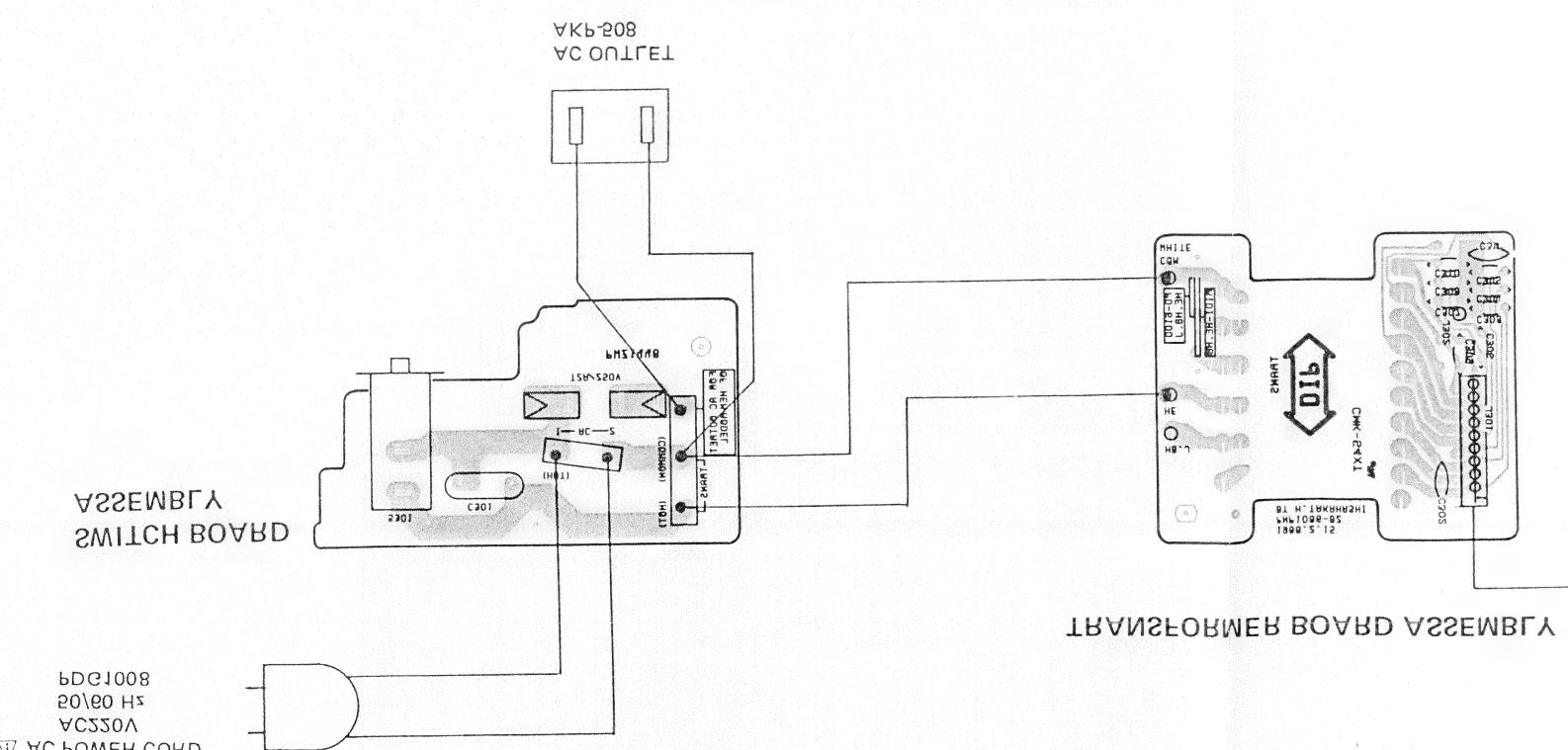


DC voltage drop of semiconductors (at 25°C)



YUHMSSA BOARD NODIFICATION

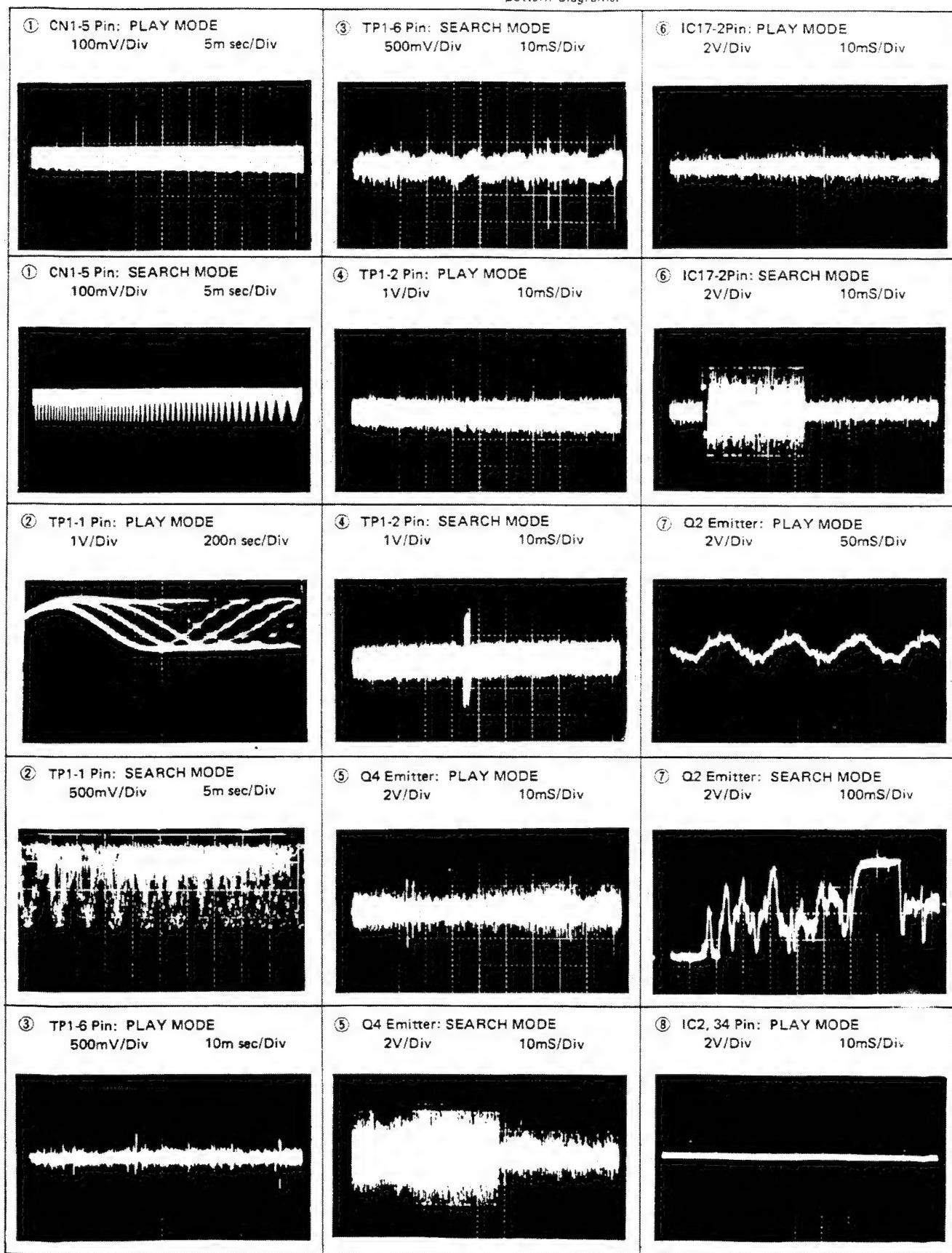
This P.C.B. connection diagram is viewed from the foil side.

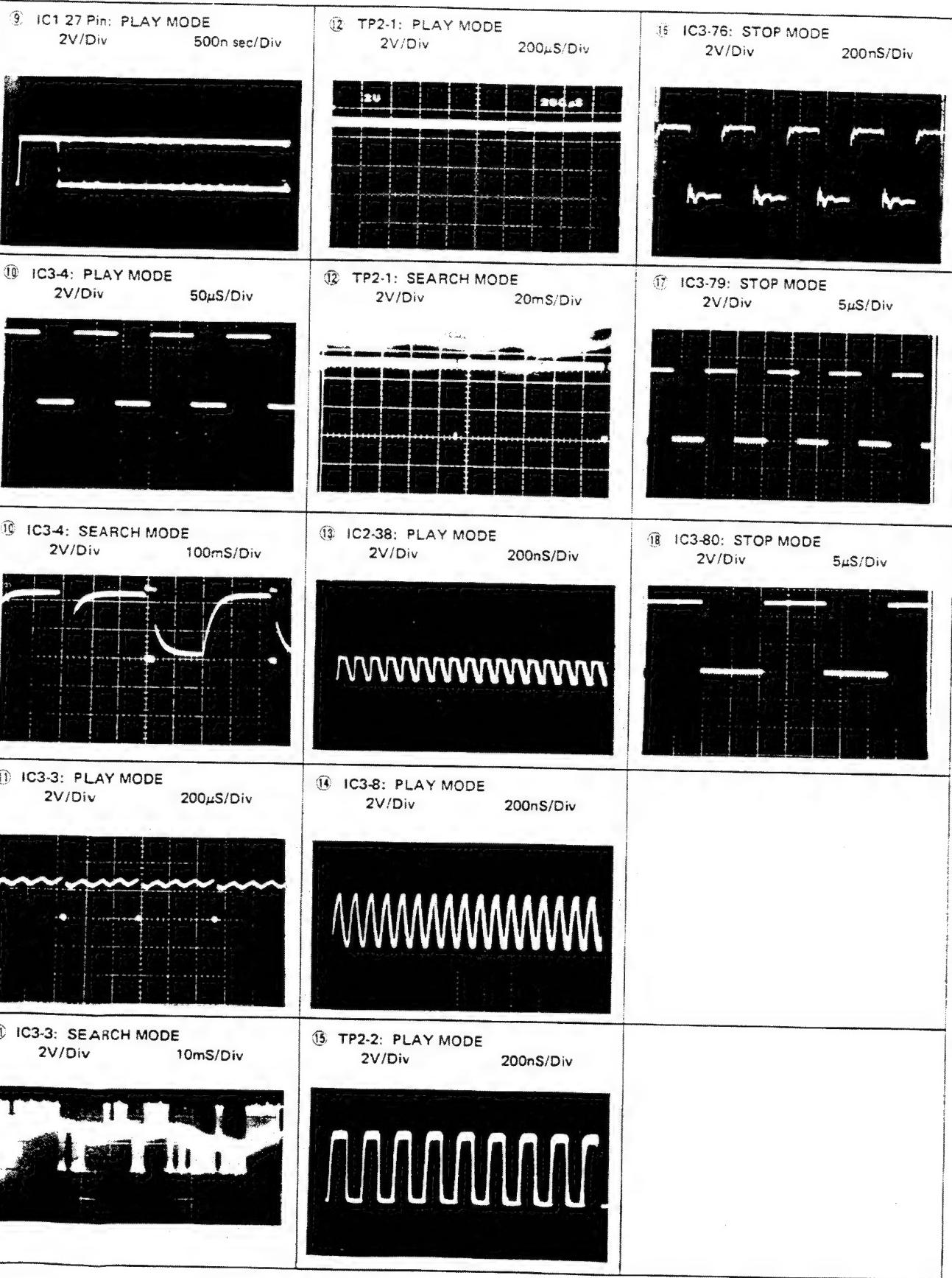


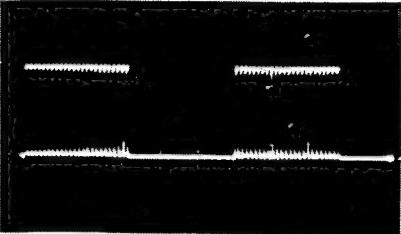
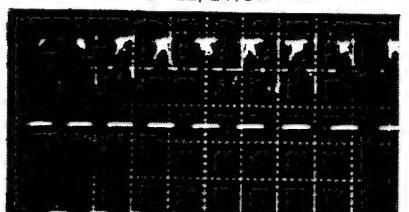
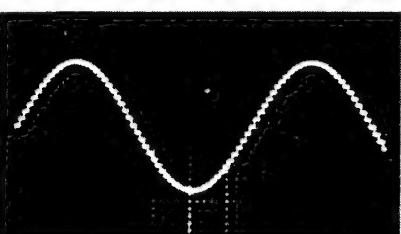
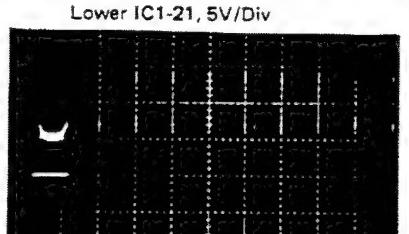
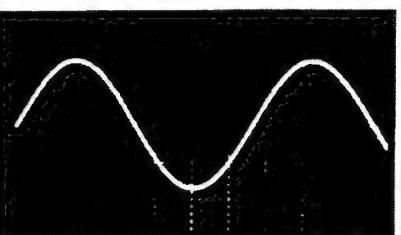
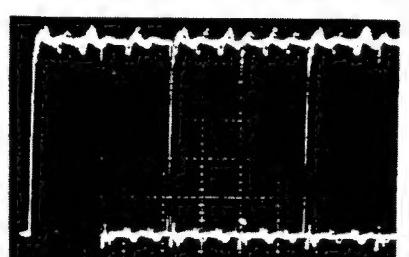
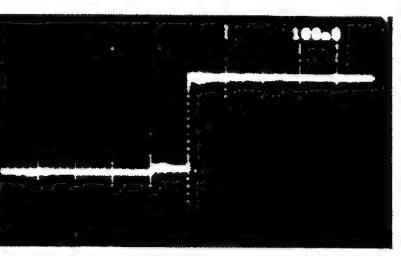
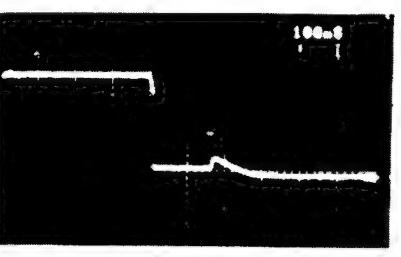
YJBMSSA BOARD FORMS AND

WAVE FORMS

NOTE: The encircled numbers denote measuring points in the circuit and pattern diagrams.





<p>⑯ IC28-9: STOP MODE 2V/Div 1μS/Div</p> 	<p>㉗ IC1-22: TR OPEN 1mS/Div Upper TP1-1, 1V/Div Lower IC1-22, 2V/Div</p> 	
<p>㉙ IC7-9: PLAY MODE 2V/Div 50μS/Div</p> 	<p>㉚ IC1-21: DFCT 1mS/Div Upper TP1-1, 1V/Div Lower IC1-21, 5V/Div</p> 	
<p>㉛ OUTPUT Lch: PLAY MODE 2V/Div 50μS/Div</p> 	<p>㉜ JA5(OTX172)-4pin: PLAY 1V/Div 1μS/Div</p> 	
<p>㉝ IC10-5: POWER ON 2V/Div 100mS/Div</p> 		
<p>㉞ IC10-5: POWER-OFF 2V/Div 100mS/Div</p> 		

6. ELECTRICAL PARTS LIST

NOTES:

- Parts without part number cannot be supplied.
- Parts marked by “◎” are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The ▲ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω	56×10^1	561.....	RDI/4PS □ □ J
47kΩ	47×10^3	473.....	RDI/4PS □ □ J
0.5Ω	0R5.....		RN2H □ □ K
1Ω	010.....		RS1P □ □ K

Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ	562×10^1	5621.....	RNI/4SR □ □ □ F
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Miscellaneous Parts

P.C. BOARD ASSEMBLY

Mark	Symbol & Description	Part No.
▲ ◎	Main board assembly	PWZ1634
	Headphone board assembly	
	Transformer board assembly	
◎	Function board assembly	PWZ1637
	Power switch board assembly	

OTHERS

Mark	Symbol & Description	Part No.
▲	1P AC outlet	AKP-508
▲	Strain relief	CM-22B
▲	AC power cord	PDG1008
▲	Power transformer (AC 220/240V)	PTT1063
▲	Fuse (2A)	REK-103
	Spindle motor	PXM1001
	Spindle motor assembly (with oil)	PYY1109
	Motor	PXM1002
	Motor assembly (CARRIAGE, LOADING)	PYY1025
S101	Slide switch (INSIDE)	PSH1003
S102	Leaf switch (OPEN/CLAMP)	VSK-015
	Pick-up assembly	PWY1010
	Servo mechanism assembly	PYY1113
	Semiconductive ceramic capacitor	CGDYX104M25

▲ ◎ Main Board Assembly (PWZ1634)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	IC1	CXA1081S.
	IC2	CXA1082BS
	IC3	CXD1135QZ
▲	IC30-IC32	ICP-N10
	IC4	LH5116-15
	IC10	M51957AL
	IC24, IC25	M5218P
▲	IC13	NJM78M12FA
	IC11	NJM7805FA
	IC14	NJM79M12FA
▲	IC12	NJM7905FA
	IC7, IC8	PCM56P .
	IC27	PD0026A
	IC28	PD0029
	IC6	PD4152
	IC17	TA8410K
	Q11, Q23	DTA124ES
	Q12, Q19, Q24, Q25	DTC124ES
	Q18	2SA1015
	Q1, Q3, Q5	2SA1399
	Q21	2SA854S
	Q8, Q9, Q16, Q17, Q27	2SC1740S
	Q22	2SC1741S
	Q2, Q4	2SC3581
	Q13, Q14	2SD1302
	D11	MTZ30B
	D12	MTZ6.8C
	D25	WL02ML-5004
	D5-D8, D10	1SR139-100

SWITCH

Mark	Symbol & Description	Part No.
S1	Tact switch	PSG-065

CAPACITORS

Mark	Symbol & Description	Part No.
C95, C96		CCCH120J50
C2, C4		CCCH300J50
C3		CCCH390J50
C140, C144, C145, C147		CCCSL221J50
C40		CEANP4R7M25
C85		CEASR33M50
C16, C22		CEASR47M50
C10, C43		CEAS101M10
C5		CEAS101M16
C88		CEAS101M50
C102, C103		CEAS102M10
C106, C107		CEAS102M16
C89, C93, C94		CEAS220M50
C123		CEAS221M16
C101		CEAS222M16
C104, C105		CEAS222M25
C48		CEAS3R3M50
C7, C12, C15, C20, C23, C25,		CEAS330M16
C26, C28, C38, C41, C50, C59, C69,		
C70, C79, C80, C84, C97, C98,		
C109-C116		
C100		CEAS332M16
C34		CEAS4R7M50
C90		CEAS470M50
C18		CEAS471M10
C86, C141, C143, C146		CKCYF103Z50
C142		CKCYF473Z50
C179		CKDYF473Z50
C33, C51, C75, C76		CQMA102J50
C14, C17, C46		CQMA103K50
C31, C32, C35, C39		CQMA104K50
C77, C78		CQMA183J50
C29		CQMA272J50
C13		CQMA332J50
C9, C11, C21		CQMA333K50
C1, C27, C49		CQMA472J50
C73, C74		CQMA682J50
C67, C68		CQMA683J50
C121, C122		CQSA102J50

RESISTORS

Mark	Symbol & Description	Part No.
VR2	Semi-fixed resistor	VRTB6VS103
VR9, VR10	Semi-fixed resistor	VRTB6VS104
VR3-VR7	Semi-fixed resistor	VRTB6VS223
VR8	Semi-fixed resistor	VRTS6VS102
R30	Metal film resistor Other resistors	RN1/6PQ3601F RD1/6PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
X3	Crystal resonator	PSS1001
X1	Ceramic resonator	VSS1014
DL1, DL2	Delay line	PTF1012
JA1	2P pin jack	PKB1009
JA5	Optical transmission module	TOTX172

Headphone Board Assembly

SEMICONDUCTOR

Mark	Symbol & Description	Part No.
IC401		M5218L

CAPACITORS

Mark	Symbol & Description	Part No.
C401, C402		CEAS330M16
C406, C407		CGDYF473Z25
C403-C405		CKCYF103Z50
C411		CKPUYF103Z25

RESISTORS

Mark	Symbol & Description	Part No.
R403-R408		RD1/6PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
JA2	Phone jack (PHONES)	PKN1001

Power Switch Board Assembly

SWITCH

Mark	Symbol & Description	Part No.
▲	S301 Power switch	PSA-009

CAPACITOR

Mark	Symbol & Description	Part No.
▲	C301	RCG-009

◎ Function Board Assembly (PWZ1637)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	D201-D208	ISS254

SWITCHES

Mark	Symbol & Description	Part No.
	S201-S203, S205-S223, S226-S228, S230 Tack switch	PSG1003

RESISTORS

Mark	Symbol & Description	Part No.
	R201-R206	RD1/4PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
V201	Fluorescent indicator tube	PEL1024
	Remote control sensor unit	GP1U50X

Transformer Board Assembly

CAPACITORS

Mark	Symbol & Description	Part No.
C302-C311		CKCYF103Z50

7. ADJUSTMENTS

The adjustments for this unit are shown below. Adjustments must be made in the order in which they are listed.

• ADJUSTMENTS

1. Tracking error offset, focus offset and RF offset adjustment
2. RF level adjustment
3. LD (laser diode) power check
4. Focus lock and spindle lock check
5. Grating adjustment (1), (2)
6. Tracking balance adjustment
7. Tangential adjustment
8. Focus gain adjustment
9. Tracking gain adjustment
10. VCO free run frequency adjustment
11. Focus error check
12. MSB adjustment

• REQUIRED EQUIPMENT

1. Dual trace oscilloscope
2. Optical power meter
3. Test disc (YEDS-7)
4. Loop gain adjustment lifter
5. Signal generator
6. Frequency counter
7. Other commonly used measuring equipment

• ABOUT THE TEST MODE

— Activating and releasing the test mode —

- (1) To activate the test mode, turn ON the power switch (S301) with the test mode switch (S1) in the ON position.
- (2) The test mode is released by turning the power switch OFF.

The functions for the keys in the test mode are outlined in Table 7-1.

• ADJUSTMENT VRs AND THEIR NAMES

- VR1: Laser power
- VR2: RF offset (RF.OFS)
- VR3: Focus gain (VCS.GAN)
- VR4: Tracking gain (TRK.GAN)
- VR5: Tracking balance (TRK.BAL)
- VR6: Focus offset (VCS.OFS)
- VR7: Tracking offset (TRK.OFS)
- VR8: VCO adjust (VCO.ADJ)
- VR9: MSB adjust R-CH (MSB.ADJ-R)
- VR10: MSB adjust L-CH (MSB.ADJ-L)

Adjusting point

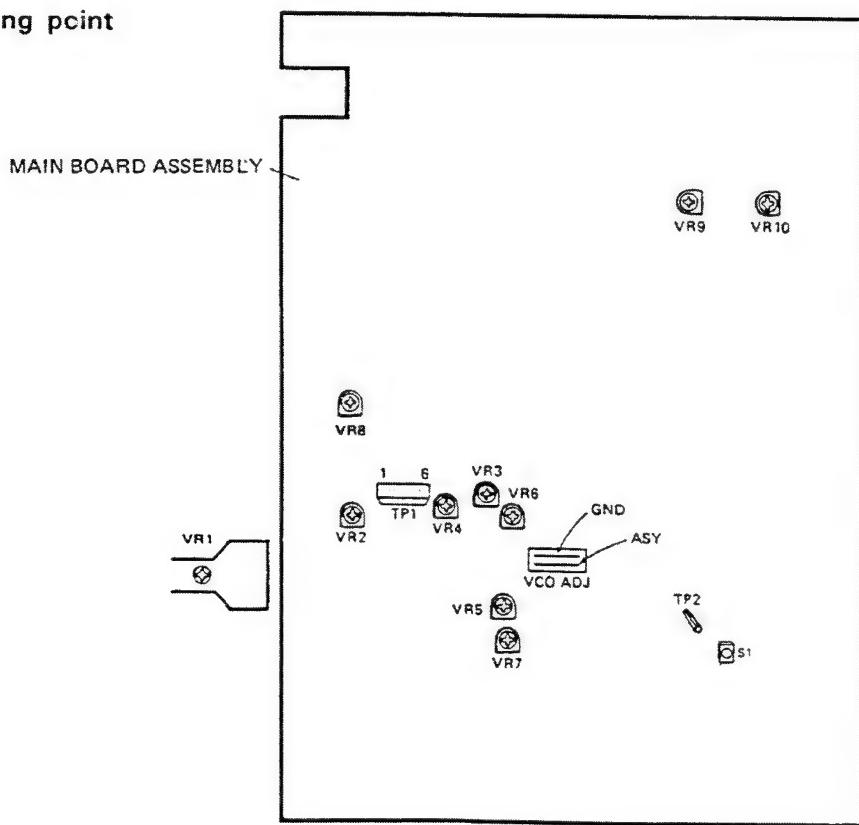
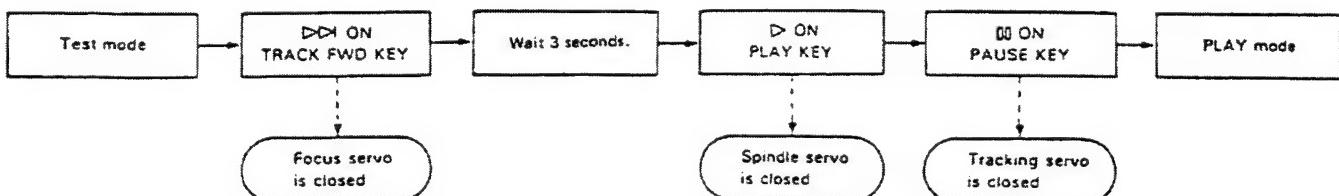


Fig. 7-1

In the test mode, the servos must be closed and opened individually. Consequently, servos must each be closed in the proper sequence (serial sequence) in order to put the machine into the play mode. Note also that during test mode the unit will not enter the play mode when the PAUSE (■■) key is pressed alone.

For example, in order to change from the stop to the play mode, the function keys must be pressed in the following order.

- * In the test mode, the servos must be operated in serial sequence.

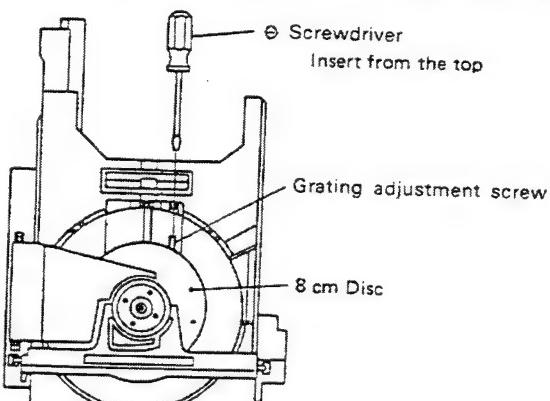
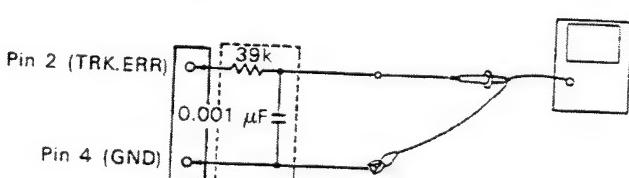


● KEY FUNCTIONS IN THE TEST MODE

Symbol	Key name	Function in test mode	Description
▷▷	TRACK FWD	Focus servo close	Turns ON the laser diode, and raises and lowers the focusing actuator to close the focus servo.
▷	PLAY	Spindle servo close	Closes the servo in the CLV-A mode after kicking the spindle motor.
■■	PAUSE	Tracking servo close/open	Acts as toggle: closes the tracking servo and activates play mode when pressed (provided the focus and spindle servos are closed), at which time the PAUSE indicator illuminates; opens the tracking servo when pressed again.
◁◁	MANUAL SEARCH REV	Carriage reverse (moves inward)	Moves carriage quickly (3 cm/s) toward inner-most track. Be careful not to move too far as there is no safety device to stop the carriage.
▷▷	MANUAL SEARCH FWD	Carriage forward (moves outward)	Moves carriage quickly (3 cm/s) toward outer-most track. Be careful not to move too far as there is no safety device to stop the carriage.
□	STOP	Stop	Stops all servos and returns system to its initial state.
▲	OPEN/CLOSE	Disc tray open/close	Opens and closes the disc tray. However, pickup does not return to rest on OPEN, and it remains stationary on CLOSE.

Table 7-1

Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check items/Adjustement specifications	Adjustment procedure
	V	H				
1 Tracking error offset, focus offset and RF offset adjustment						
			TP1 Pin 2 (TRK.ERR)	VR5 (TRK.BAL) VR7 (TRK.OFS)	Tracking error offset 45° 0V±50 mV	<ul style="list-style-type: none"> Set the unit to test mode (see page 29). Set VR5 TRK.BAL (tracking balance) to the position about 45° to the left of center. Adjust VR7 TRK.OFS (tracking offset) so that the TRK.ERR (tracking error) voltage at TP1 Pin 2 becomes 0V±50 mV. Adjust VR6 FCS.OFS (focus offset) so that the FCS.ERR (focus error) voltage at TP1 Pin 6 becomes 0V±50 mV. Adjust VR2 RF.OFS (RF offset) so that the RF output voltage at TP1 Pin 1 becomes 100 mV±50 mV. <p>Note: When adjusting the tracking error offset, always perform "6. Tracking Balance Adjustment."</p>
2 RF level adjustment						
			TP1 Pin 1 (RF OUTPUT)	VR1 (Laser power)	1.5V±0.2V	<ul style="list-style-type: none"> Set the unit to test mode (see page 29). Play the test disc, connect the oscilloscope to TP1 Pin 1 (RF output), and measure the P-P voltage of the RF waveform. Check that the voltage is 1.5V±0.2V.
3 LD (laser diode) power check						
					Less than 0.13 mW	<ul style="list-style-type: none"> Set the unit to test mode (see page 29). Press the TRACK FWD (\gg) key to turn ON the LD (laser diode). Place the sensor of the optical power meter directly above the objective lens and confirm that LD power is less than 0.13 mW.
4 Focus lock and spindle lock check						
	V 0.5V/div	H 100 msec/div	TP1 Pin 1 (RF output)		RF signal is output Forward (clockwise) rotation	<ul style="list-style-type: none"> Set the test disc. Set the unit to test mode (see page 29). Press the MANUAL SEARCH FWD (\gg) key to move the pickup to the center of the disc. Observe the output (RF output) of TP1 Pin 1 on the oscilloscope. Confirm that the RF signal is output after the TRACK FWD (\gg) key is pressed. Press the PLAY ($>$) key and confirm that the disc rotates at constant speed (approx. 300 rpm near center of disc) in the forward (clockwise) direction; make sure that the disc does not rotate too fast or counterclockwise.

Step No.	Oscilloscope Setting	Test Points	Adjusting Points	Check items/Adjustment specifications	Adjustment procedure
	V	H			
5	Grating adjustment (1) (When using an 8 cm disc.)				
			 <p>Note: This adjustment can only be performed with a disc having pits up to 75mm diameter.</p> <ul style="list-style-type: none"> Set the unit to test mode (see page 29). Load the 8 cm disc, shift the pickup to the outer periphery so that the pickup grating adjustment hole is visible from the pit surface of the disc or from the hole in the servo mechanism (see Fig. 7-3.). Press the TRACK FWD (\rightarrow) and the PLAY ($>$) keys in sequence to close the focus servo and spindle servo (do not close the tracking servo). Observe the waveform output by TP1 Pin 2 TRK.ERR (tracking error) on an oscilloscope, inserting a 4 kHz low-pass filter (see Fig. 7-3.). 		
			 <p>Fig. 7-3</p>		
	0.5V/div	5 msec/div	TP1 Pin 2 (TRK.ERR)	Grating	<p>Null Point Maximum amplitude</p> <ul style="list-style-type: none"> Insert a \ominus screwdriver into the grating hole, turn and find the null point (see Photo 7-1.). Next, slowly turn the \ominus screwdriver counter-clockwise from the null point and adjust until the waveform (tracking error signal) reaches maximum amplitude (see Photo 7-2.). <p>Note: Use caution since inserting the \ominus screwdriver forcefully will cause the pickup unit to float upward.</p> <ul style="list-style-type: none"> Finally, confirm that there is no major fluctuation in the p-p voltage of the tracking error signal (do not insert the cutoff 4 kHz low-pass filter) when the pickup is shifted to the inner periphery and when the pickup is shifted to the outer periphery. If there is a difference of more than $\pm 10\%$ again rotate the grating adjustment screw and adjust the tracking error signal to maximum amplitude point.

Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check items/Adjustment specifications	Adjustment procedure
	V	H				
6	Grating adjustment (2) (When an 8 cm disc is not available.)					

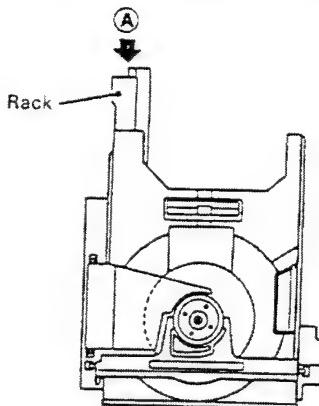


Fig. 7-4

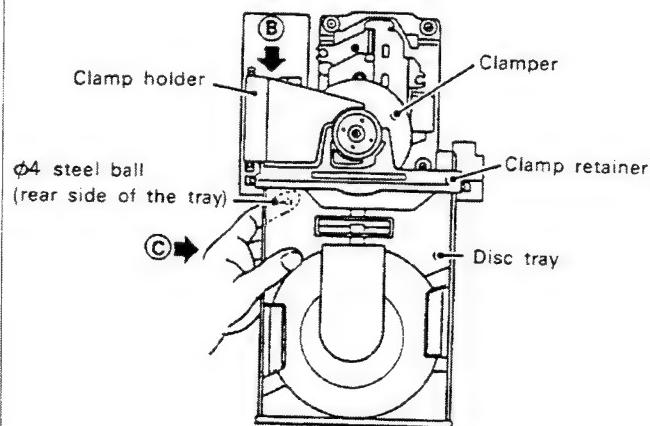


Fig. 7-5

This adjustment is to be performed when an 8 cm disc is not available and when grating adjustment cannot be performed. Perform this adjustment after removing the disc tray.

● Removal of the disc tray

1. Press the rear edge of the rack, marked (A) in Fig. 7-4., while pulling the disc tray out to the position where it catches, illustrated in Fig.7-5.

(*1) When the rear section of the rack (arrow (A)) is pressed, first the disc clamp is released. To slide out the disc tray fully, continue to press after the clamp has been released.

2. While pulling the clamp holder (B) (see Fig. 7-5.) upward with the right hand, hold the tray as indicated by (C) in the left hand and pull it outward. Take care not to allow the φ4 steel ball to fall out (it is recommended to hold the ball in place with the left index finger while extracting the tray).

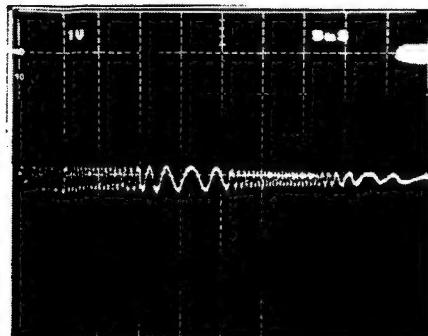


Photo 7-1 Null point

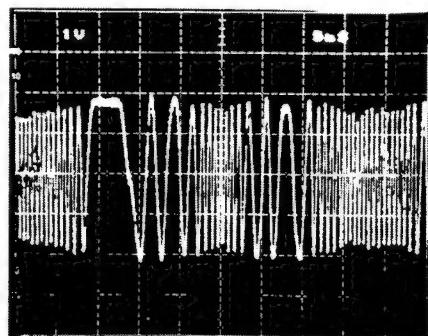


Photo 7-2 Maximum amplitude

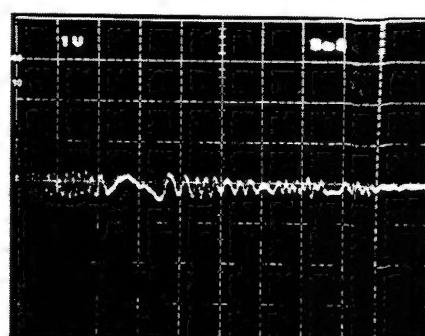
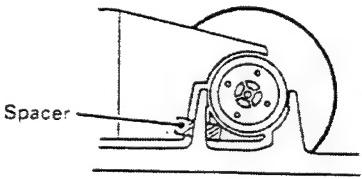
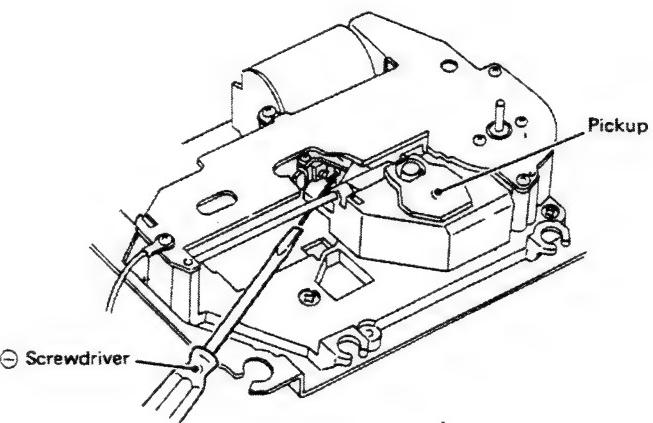
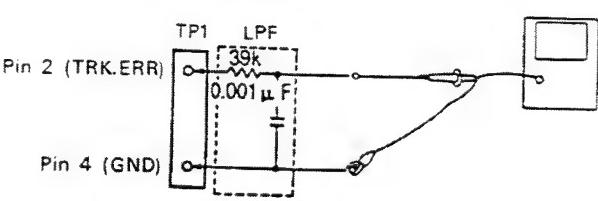
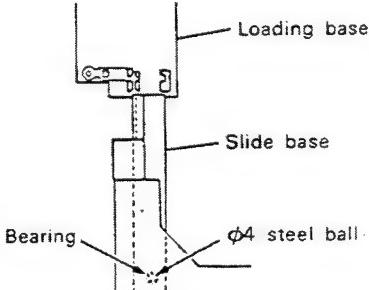
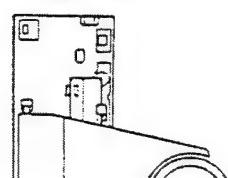
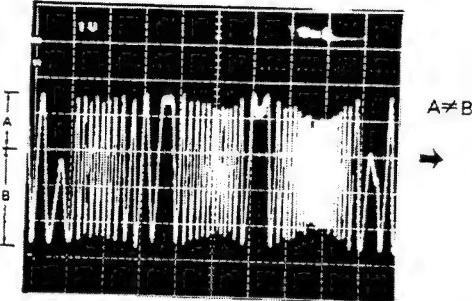
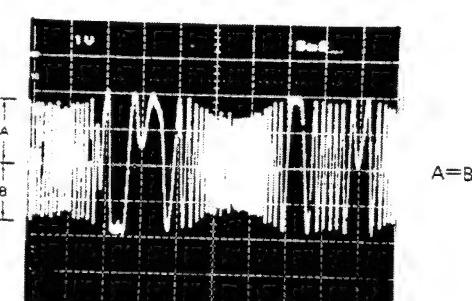
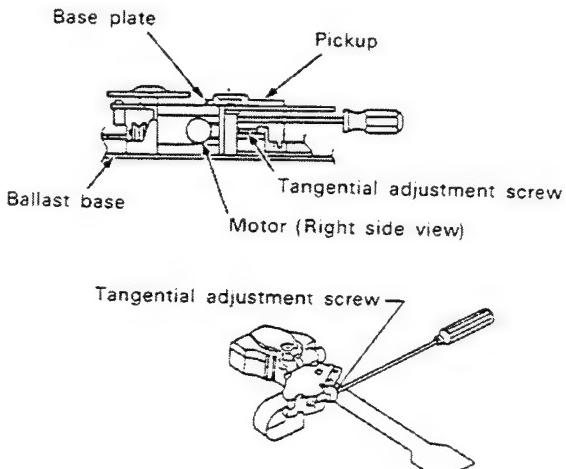


Photo 7-3 This is not the null-point waveform

Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check items/Adjustement specifications	Adjustment procedure
	V	H				
						
					Fig. 7-6	
						
					Fig. 7-7	
						
					Fig. 7-8	
						
					Fig. 7-9	
						<ul style="list-style-type: none"> ● Put unit in the test mode (see page 29). ● Press the MANUAL SEARCH FWD ($\triangleright\triangleright$) key to move the pickup to the vicinity of what would be the center of the disc. Position the pickup so its grating adjusting screw is visible through the elongated hole on the spindle motor side of the servo mechanism base plate. ● As shown in Fig. 7-8., insert a (slotted) \ominus screwdriver from the rear of the mechanism and check that the grating adjusting screw can be rotated. ● Mount the test disc : be sure to insert a 3-5 mm spacer (if no spacer is available, use a hex wrench) between the clamp holder and clamp retainer, as shown in Fig 7-6. ● Confirm that the clamper and the clamp retainer are not contacting one another (Fig. 7-7.). ● Press the TRACK FWD ($\triangleright\triangleright\downarrow$) and the PLAY ($\triangleright$) keys sequentially to close the focus and spindle servos (do not close the tracking servo). ● Insert a 4 kHz-cutoff low pass filter between the oscilloscope and TP1 pins 2 (TRK.ERR) and 4 (GND) as shown in Fig. 7-9 and observe the waveform of TP1 pin 2 (tracking error) on the oscilloscope.

Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check items/Adjustement specifications	Adjustment procedure
	V	H				
	0.5V/div	5 msec/div	TP1 Pin 2 (TRK.ERR)	Grating adjustment screw Grating adjustment screw	Null point Max. amplitude	<ul style="list-style-type: none"> Turn the grating adjustment screw with the \ominus screwdriver to find the null point (see Photo 7-1.). Next, slowly rotate the screw counterclockwise and adjust to the point where the waveform (tracking error signal) first achieves its maximum amplitude (see Photo 7-2.). Note: Avoid applying pressure to the screwdriver while adjusting the screw. Doing so causes the pickup to move inward, making adjustment more difficult. Lastly, remove the low pass filter and confirm that the tracking error signal p-p voltage does not greatly vary when the pickup is moved to the innermost and outer-most tracks of the disc. If the levels diverge by $\pm 10\%$ or more re-adjust the maximum error amplitude point by rotating the grating adjustment screw.
						 <p>Fig. 7-10</p>  <p>Fig. 7-11</p> <p>Remount the disc tray according to the following procedure when the grating adjustment is complete.</p> <ol style="list-style-type: none"> Remove the disc and the spacer. While lifting the clamp holder [marked B in Fig. 7-5.] with the right hand, hold the tray in the left hand as indicated by C and slide the slide base into the hard resin fittings on the loading base as shown in Fig. 7-10, to reinsert the disc tray. (At this time, be sure to hold the $\phi 4$ steel ball in place with the index finger of the left hand.) (Also, be careful that the front panel is not damaged by the bearing of the slide base at the $\phi 4$ steel ball section coming into contact with the panel.) Insert the slide base so that it fits into the two hard resin fittings at the rear of the loading base (see Fig. 7-11.). Insert the tray all the way.

Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check items/ Adjustment specifications	Adjustment procedure
	V	H				
7	Tracking balance adjustment					
	0.5V/div	5 msec/div	TP1 Pin 2 (TRK.ERR)	VR5 (TRK.BAL)		<ul style="list-style-type: none"> Load the test disc. Set the unit to test mode (see page 29). Press the MANUAL SEARCH FWD (\gg) key to position the pickup near the center of the disc. Press the TRACK FWD (\gg) and PLAY (\triangleright) keys sequentially to cause the disc to rotate. Observe the waveform output by TP1 Pin 2 TRK.ERR (tracking error) on the oscilloscope and adjust VR5 TRK.BAL (tracking balance) so that the DC components are eliminated from the tracking error signal.
						
	<p>Photo 7-4 DC elements mixed in signal</p>					
						<p>Photo 7-5 DC elements eliminated</p>
8	Tangential adjustment					
						<ul style="list-style-type: none"> Set the unit to test mode (see page 29). Open the tray and load the test disc. Press the MANUAL SEARCH FWD (\gg) key to position the pickup near the center of the disc. Insert a hex wrench into the tangential adjustment screw section from the rear of the mechanism. Close the tray. <p>Note: An L-shaped hex wrench should not be used. Use one such as shown on the left. If an L-shaped hex wrench is to be used, the tray must be removed before performing adjustment (see page 33, 6. Grating Adjustment (2)).</p>
	<p>Fig. 7-12</p>					<ul style="list-style-type: none"> Press the TRACK FWD (\gg), PLAY (\triangleright), and PAUSE (\times) keys sequentially to close all the servos (the pause indicator will illuminate).

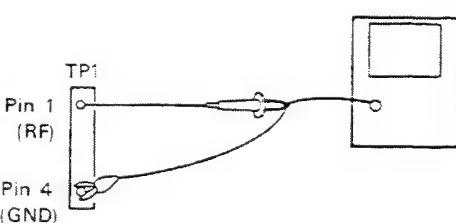
Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check items/Adjustement specifications	Adjustment procedure
	V	H				
	200 nsec/div		TP1 Pin 1 (RF output)	Tangential adjustment screw	Sharpest possible eye pattern	<ul style="list-style-type: none"> Observe the waveform output by TP1 Pin 1 (RF output) on the oscilloscope and adjust the tangential adjustment screw to achieve the sharpest possible eye pattern. The point to which the adjusting screw should be set lies about halfway between the points where the eye pattern becomes most blurred when the screw is rotated clockwise and counterclockwise. When the whole waveform becomes clear, concentrate on sharpening the fine lines forming the diamond at the center of the eye pattern (see Photo 7-8.). Adjust until the fine lines on all four sides of the diamond are both sharply defined and dense. 

Fig. 7-13

Note: Use a hex wrench to raise the pickup somewhat while making this adjustment.

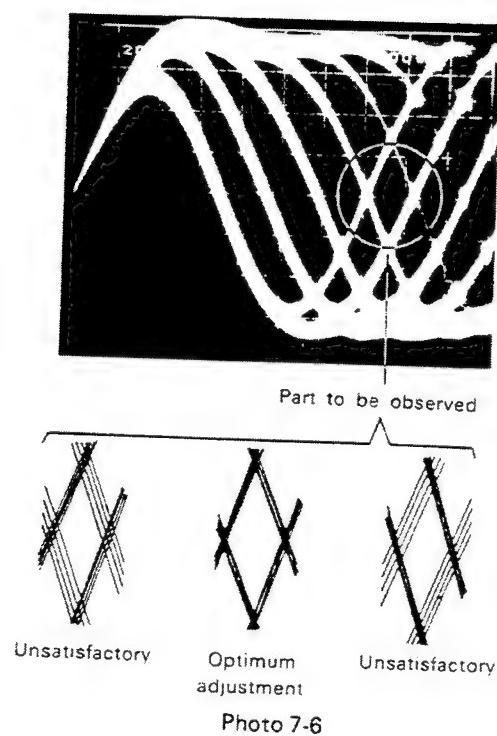


Photo 7-6

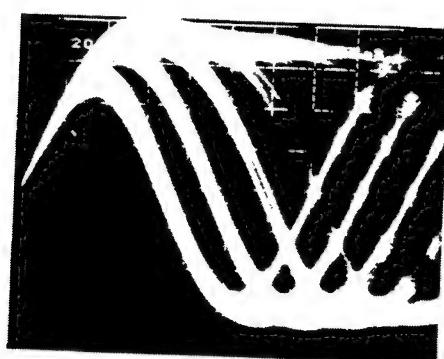


Photo 7-7

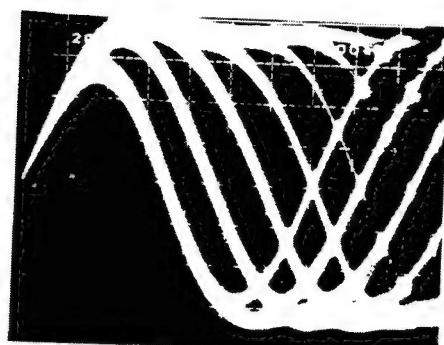


Photo 7-8

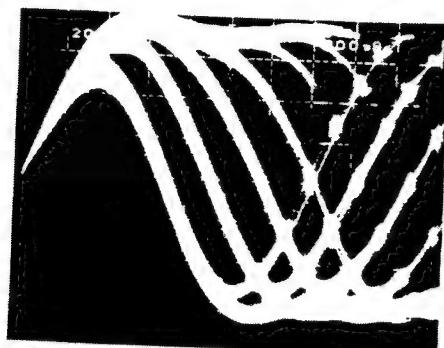


Photo 7-9

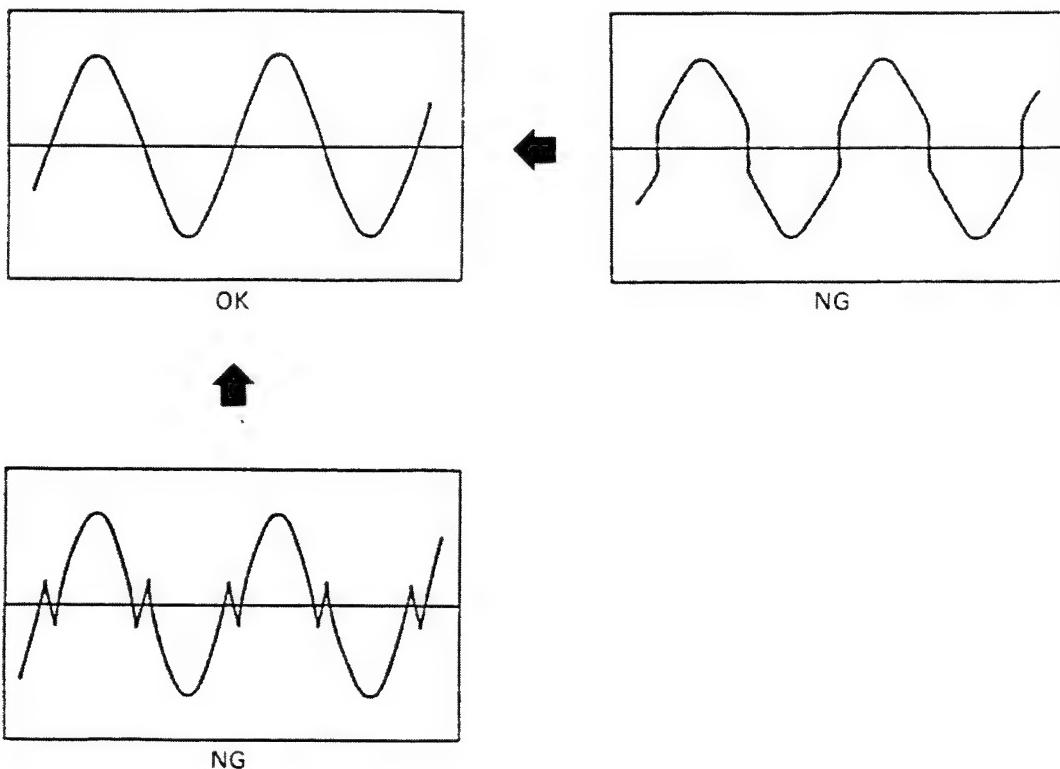
Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check items/Adjustement specifications	Adjustment procedure
	V	H				
9	Focus gain adjustment					
	CH1(X), 20mV/div (probe: 10:1)	CH2(Y) 5mV/div	X-axis TP1 Pin 5 (FCS. IN) Y-axis TP1 Pin 6 (FCS. ERR)	VR3 (FCS. GAN)	Phase difference of 90°	<ul style="list-style-type: none"> With the oscillator power turned OFF, connect the oscilloscope and oscillator as shown in Fig 7-14. Set to normal play condition. Turn ON the power to the oscillator and set it to output a 1.2 kHz 1 Vp-p signal. <p>Note: Some oscillators discharge a DC voltage when turned on. It is therefore recommended that the oscillator be connected after it has been turned on.</p> <ul style="list-style-type: none"> Adjust VR3 FCS.GAN (focus gain) so that the Lissajous's figure becomes a horizontal circle on the oscilloscope (phase difference of 90°).
	Gain overcompensated Photo 7-10		Gain optimal Photo 7-11		Gain undercompensated Photo 7-12	

Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check items/Adjustement specifications	Adjustment procedure
	V	H				
10	Tracking gain adjustment					<ul style="list-style-type: none"> With the oscillator power turned OFF, connect the oscilloscope and oscillator as shown in Fig 7-15. Set to normal play condition. Turn ON the power to the oscillator and set it to output a 1.2 kHz 2 Vp-p signal. <p>Note: Some oscillators discharge a DC voltage when turned on. It is therefore recommended that the oscillator be connected after it has been turned on.</p> <ul style="list-style-type: none"> Adjust VR4 TRK.GAN (tracking gain) so that the Lissajous's figure becomes a horizontal circle on the oscilloscope (phase difference of 90°). <p>Fig. 7-15</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Gain overcompensated Photo 7-13</p> </div> <div style="text-align: center;"> <p>Gain optimal Photo 7-14</p> </div> <div style="text-align: center;"> <p>Gain undercompensated Photo 7-15</p> </div> </div>

Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check items/ Adjustment specifications	Adjustment procedure
	V	H				
11	VCO free run frequency adjustment					
			TP2 Pin 2	VR8 (VCO.ADJ)	4.275 ± 0.025 MHz	<ul style="list-style-type: none"> • Set the unit to test mode (see page 29). • Short the ASY and GND jumper with a \ominus screwdriver or similar tool (see Fig. 7-1.). • Connect a frequency counter capable of measuring frequencies of 10 MHz and above to TP2 Pin 2. • Adjust VR8 VCO.ADJ (VCO free run adjustment) so that the frequency counter reading becomes 4.275 ± 0.025 MHz.
12	Focus error check					
			TP1 Pin 6 (FCS.ERR)			<ul style="list-style-type: none"> • Set the unit to test mode (see page 29). • Ground TP1 Pin 5 FCS.IN (focus in) to GND. • Observe the waveform output by TP1 Pin 6 FCS.ERR (focus error) when the TRACK FWD (\gg) key is pressed.

Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check items/Adjustement specifications	Adjustment procedure
	V	H				
13	MSB adjustment					

● Zero cross distortion waveform



Line Voltage Selection (for HEM and HB types)

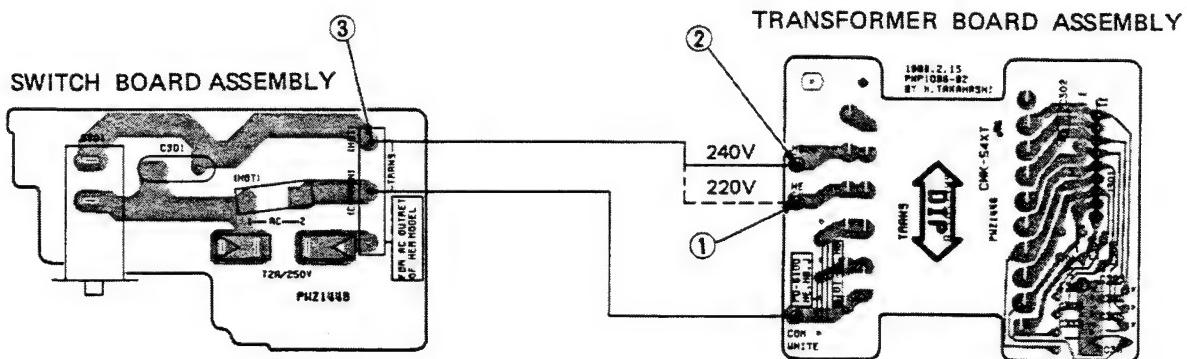
- Line voltage can be changed with the following steps.

1. Disconnect the AC power cord.
2. Remove the bonnet case.
3. Change the connection wire from Switch board assembly (Terminal NO. ③) to Transformer board assembly (Terminal NO. ① or ②) as follows.

Voltage	Terminal NO. of Transformer board assembly
220V	①
240V	②

4. Stick the line voltage label on the rear panel.

Part NO.	Description
AAX-193	220V label
AAX-192	240V label



8. FOR HB TYPE

8.1 CONTRAST OF MISCELLANEOUS PARTS

NOTES:

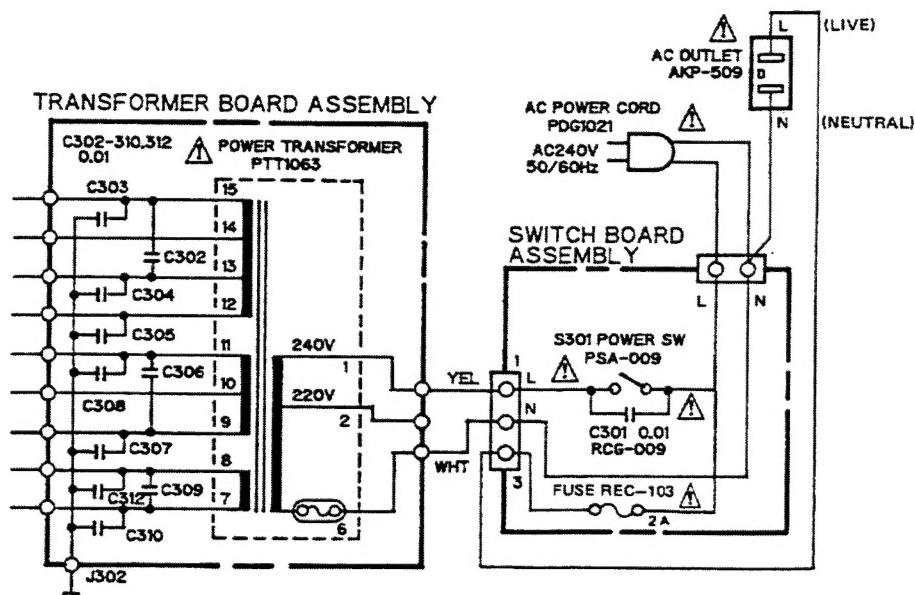
- Parts without part number cannot be supplied.
- The **▲** mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by “●” are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

The PD-X550/HB type is the same as the PD-X550/HEM type with the exception of the following sections.

Mark	Symbol & Description	Part No.		Remarks
		PD-X550/HEM	PD-X550/HB	
▲	1P AC outlet	AKP-508	AKP-509	
▲	AC power cord	PDG1008	PDG1021	
	Operating instructions (English)	...	PRB1094	
	Operating instructions (English/French/Spanish/German/ Italian/Swedish/Dutch/Portuguese)	PRE1094	...	

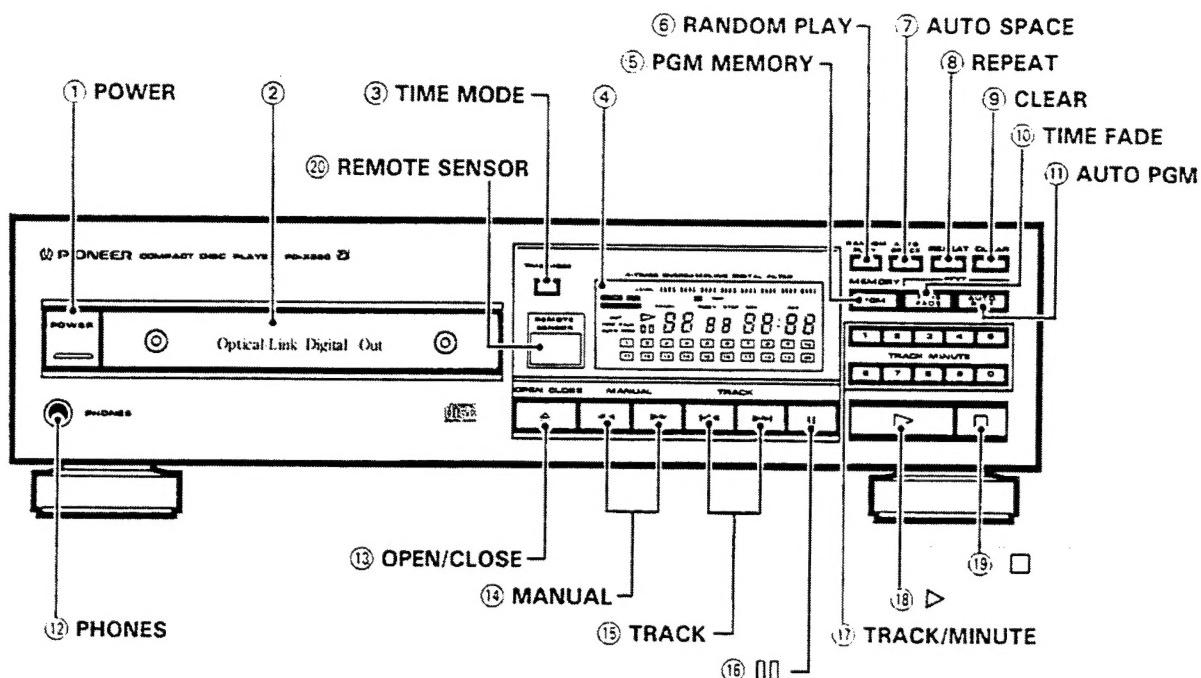
8.2 SCHEMATIC DIAGRAM

- For HB type



9. PANEL FACILITIES

FRONT PANEL



① POWER switch

Press to turn power to the unit ON and OFF.

② Disc tray

This is where the disc is set. When power is switched ON and the OPEN/CLOSE key is pressed, the tray is ejected forward. To insert the tray, press the OPEN/CLOSE key, or lightly push the tray in with your finger. With the disc tray open, pressing the play key will close the disc tray and start playback.

③ TIME MODE key

This key selects the display mode of the indicator panel. Each time the key is pressed, the indication changes from TIME, REM, to TOTAL in that order. (For details concerning the display contents, refer to the explanation about the indicators.)

If pressed after pressing the track number key, the playback time of the selected track only is displayed.

④ Indicators

LEVEL	: The volume level of fade-out is displayed.
PGM	: Lights after programming (after program has been memorized).
RND	: Lights during random playback.
AUTO SPACE	: Lights during auto space playback.
1 - REP	: Lights during repeat playback of one track.
REP	: Lights during repeat playback.
D (PLAY)	: Light during playback.
II (PAUSE)	: Light during temporarily interrupt playback.
TRACK 1 - 20 (Music calendar)	: Displays the current track number (during normal playback and programmed playback) or the track being programmed during program-

ming operation. The lower figures light up in accordance with the number of tracks recorded on the disc, and the numbers of the tracks which have been played are deleted in order. (During programmed playback only the programmed tracks light.)

INDEX : Displays the index * number of the music section of a track or the track division.

STEP : Displays the program steps.

MIN (minute) : Displays the minutes of the elapsed time, total playback time, and remaining time.

SEC (second) : Displays the seconds of the elapsed time, total playback time, and remaining time.

TIME/REM/TOTAL

: Changes each time the TIME MODE key is pressed.

● TIME : Displays the track number of the track being played (TRACK) and the elapsed time (minutes and seconds).

● REM : Displays the remaining time on the track being played.

When the TIME MODE key is pressed again, the remaining time on the disc will be displayed.

● TOTAL : Displays the total number of tracks on the disc (TRACK) and the overall playback time (minutes and seconds).

During playback, the display goes off about 5 seconds before changing to the TIME display.

Programmed playback operation displays the remaining time of the programmed tracks (REMAIN), and the total playback time (TOTAL).

TIME FADE EDIT

: Displays when Time Fade Editing is set or used.

AUTO PGM EDIT

: Displays when Auto Program Editing is set or used.

- The INDEX is a signal which is recorded within a track to indicate division of the track into separate tunes and items of music.

(5) PGM MEMORY key

Use to program a sequence of tracks.

(6) RANDOM PLAY key

Press to begin random playback.

(7) AUTO SPACE key

During playback, there will be a pause of about three seconds before the next track is played.

(8) REPEAT key

Press this key for repeat playback. Pressing the key once, twice, or three times will change the repeat mode from single track repeat, all tracks repeat, and repeat playback cancellation.

(9) CLEAR key

Press this key to clear the program.

(10) TIME FADE key

Press this key to end playback at a desired time with fade-out.

(11) AUTO PGM key

Press to program a tune which may be played back within a specified time.

(12) PHONES (headphones) jack

When you wish to use headphones, insert the plug for the headphones into the headphone jack.

(13) OPEN/CLOSE key (▲)

Press when you wish to eject or load a disc. Each time the key is pressed, the tray is alternately pushed out or pulled in.

(14) MANUAL search keys (◀◀, ▶▶)

When the player is in playback or pause modes, these keys are pressed to perform fast forward or reverse operations to allow manual searching. These operations are only carried out during the time either key is pressed.

(15) TRACK search keys (◀◀, ▶▶)

During normal playback, programmed playback or pause modes, these keys are pressed to search for the desired track. Pressing either key causes the player to advance to the next track or to return to the previous track. Even in stop mode, these keys can be used to select the desired track. Press the PLAY key to playback the desired track.

(16) Pause key (□□)

Press to temporarily interrupt playback. When pressed again, the pause mode is cancelled and playback resumes.

(17) TRACK/MINUTE keys (1 to 0)

- Use to specify track numbers (track 1 – track 99) for selection of tracks or program entry.
- Use to specify time (in minutes), during auto program editing and time fade editing.

(18) Play key (▷)

Press to begin playback, and to cancel the pause mode.

(19) Stop key (□)

Press to stop playback. When pressed, the player goes into stop mode and all operations stop.

(20) REMOTE SENSOR

10. SPECIFICATIONS

1. General

Type	Compact disc digital audio system
Power requirements	
European models	AC 220 V, 50/60 Hz
U.K., Australian models	AC 240 V, 50/60 Hz
U.S., Canadian models	AC 120 V, 60 Hz
Other models	AC 110/120–127/220/240 V (switchable), 50/60 Hz
Power consumption	16 W
Operating temperature	+5° C – +35 °C (+41 °F – +95 °F)
Weight	3.9kg (8lb, 10oz)
External dimensions	360(W) × 334(D) × 98(H) mm 14-3/16(W) × 13-3/16(D) × 3-7/8(H) in.

2. Audio section

Frequency response	4 Hz – 20 kHz (± 0.5 dB) (EIAJ)
S/N	104 dB or more (EIAJ)
Dynamic range	95 dB or more (EIAJ)
Channel separation	96 dB or more (EIAJ)
Total harmonic distortion	0.004% or less (EIAJ)
Output voltage	2.0 V
Wow and flutter	Limit of measurement ($\pm 0.001\%$ W.PEAK) or less (EIAJ)
Number of channels	2 channels (stereo)

3. Output terminal

- Optical digital output terminal
- Audio line output terminal
- Headphone jack

4. Functions

- Play
- Pause
- Manual search
- Track search
- Direct track search
- One track repeat
- All track repeat
- Random play repeat
- Programmed repeat
- Programmed playback
- Pause program
- Add-on program
- Auto program editing
- Time fade editing
- Timer start
- Random play
- Auto space

5. Accessories

- | | |
|--------------------------------|---|
| ● Output cable | 1 |
| ● Operating instructions | 1 |

NOTE:

The specifications and design of this product are subject to change without notice, due to improvements.